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DOT/FAA/CT-93/5-III

FAA Technical Center Atlantic City International Airport N.J. 08405 S-76 High Intensity Radiated Fields: Volume III

October 1993

Final Report

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16. Abstract

The Federal Aviation Administration (FAA) Technical Center sponsored a series of High Intensity Radiated Fields (HIRF) test on a Sikorsky S-76 rotorcraft. The project was conducted to evaluate the practically of performing aircraft level HIRF tests, determine the effects of HIRF on a specific rotrocraft with the potential to obtain information on rotorcraft in general, and evaluate the effects of exposure to "real world" HIRF emitters.

HIRF ground and flight tests were conducted to achieve the objective of the project. Site calibration (SCAL) measurements were made in the test area to determine the levels at which the S-76 would be irradiated when placed in the test area. Ground tests consisted of Low Level Swept Coupling (LLSC) and Low Level Swept Fields (LLSF) tests. The flight tests were flown directly into the main beam of a variety of pulsed and continuous wave (CW) transmitters including the Over the Horizon Back Scatter (OTHB), PAVE PAWS, ASR-9, FPS-65, and FPS-16 radars. Results of the S-76 tests added credibility to the existence of HIRF as a flight safety hazard. In the evaluation of the emitters, the flight tests showed repeatable instances where exposure resulted in instrumentation disruptions. It should however be noted that all the observed disruptions were of a non-critical nature.

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HIRF Electromagnetic Fields LLSC Helicopter	Document is available to the public through the National Technical Information Service, Springfield, Virginia 22161		
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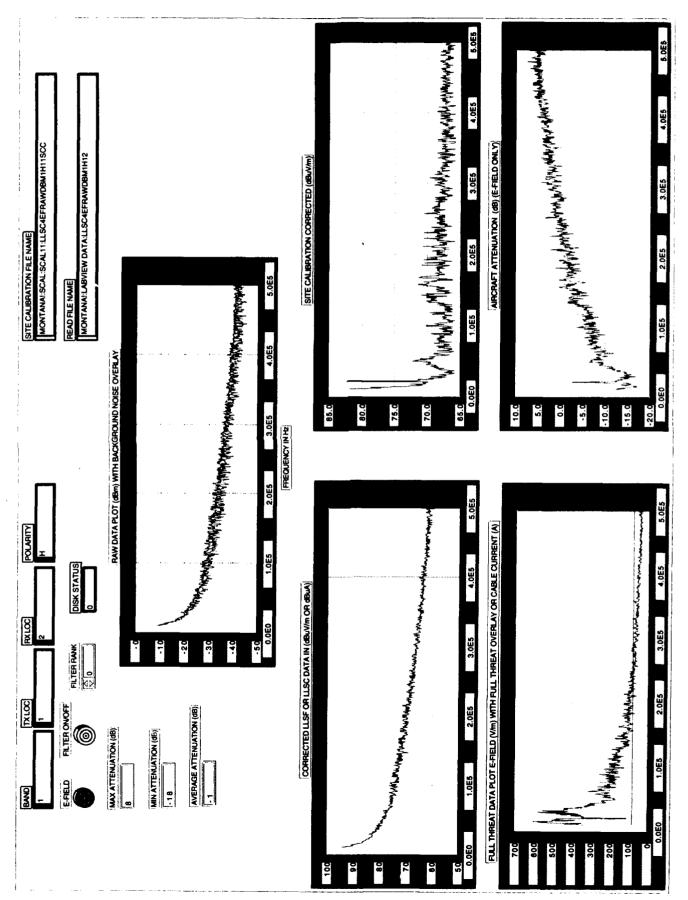
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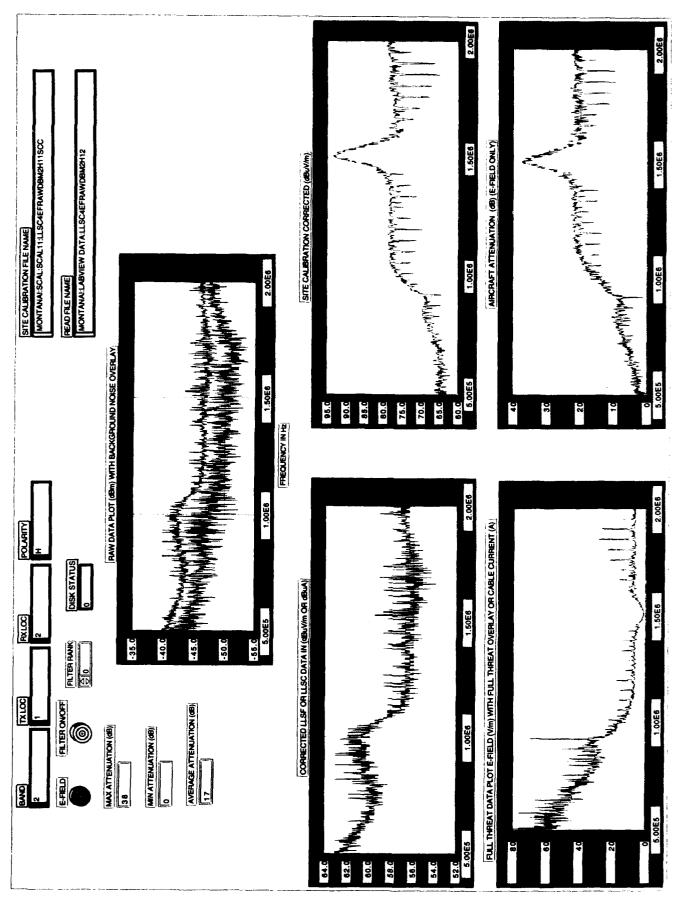
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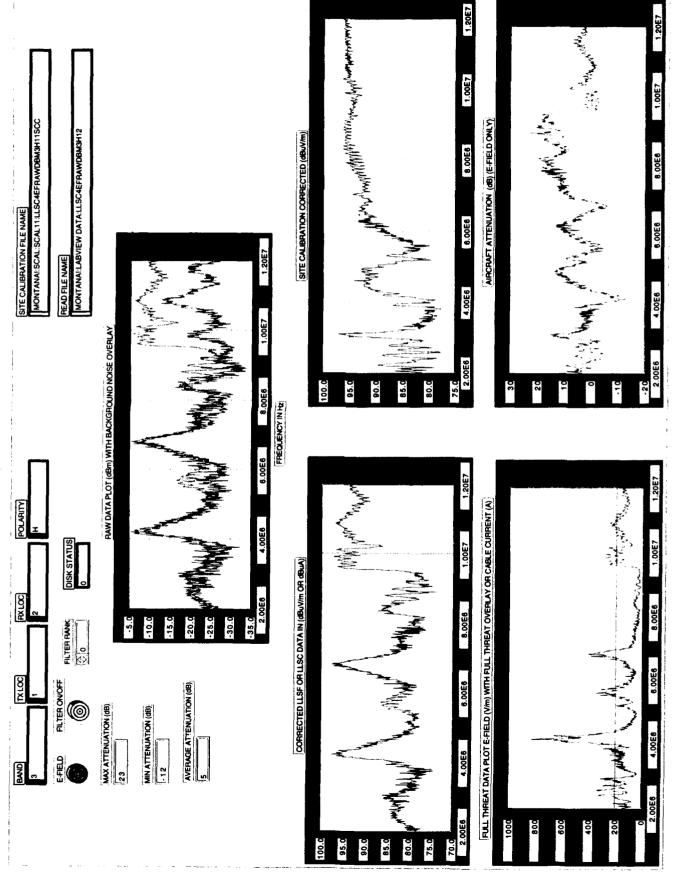
The LLSF data plots (sample on the following page) each contain the following information:

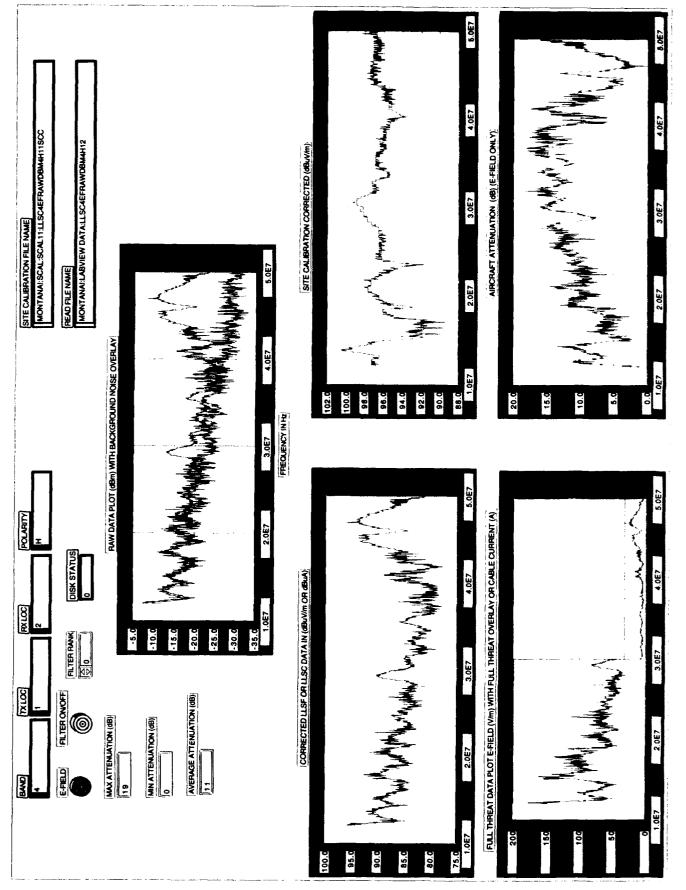
- Band number identification (Band)
- S-76 orientation during the test (TXLOC)
- Receive configuration location (RXLOC)
- Transmit Antennae Polarity (POLARITY)
- Full threat data array size (ARRAY SIZE used internally by software application to process the data)
- Name of the corrected SCAL data file
- Data type indicator (if black indicates plot is LLSF data)
- SCAL data type indicator (if black indicated plot is SCAL data)
- Disk read error indicator (DISK STATUS)
- Single corrected data value (NEW DATA VALUE used internally by software application to process data)
- Original uncorrected LLSF data file name (READ FILE NAME)
- Original LLSF Data Plot in dBm with background noise overlay (RAW DATA PLOT (dBm) WITH SNR)
- Corrected data plot in dBuV/m (CORRECTED DATA PLOT dBuV/m OR dBuA)
- SCAL corrected data plot with values in dBuV/m (SITE CALIBRATION CORRECTED (dBuV))
- LLSF data plot extrapolated to full threat (FULL THREAT DATA PLOT (V/m) OR CABLE CURRENT (A) WITH FULL THREAT OVERLAY)
- Aircraft attenuation as a function of frequency in dB data plot (AIRCRAFT ATTENUATION (dB) (E-FIELD ONLY))

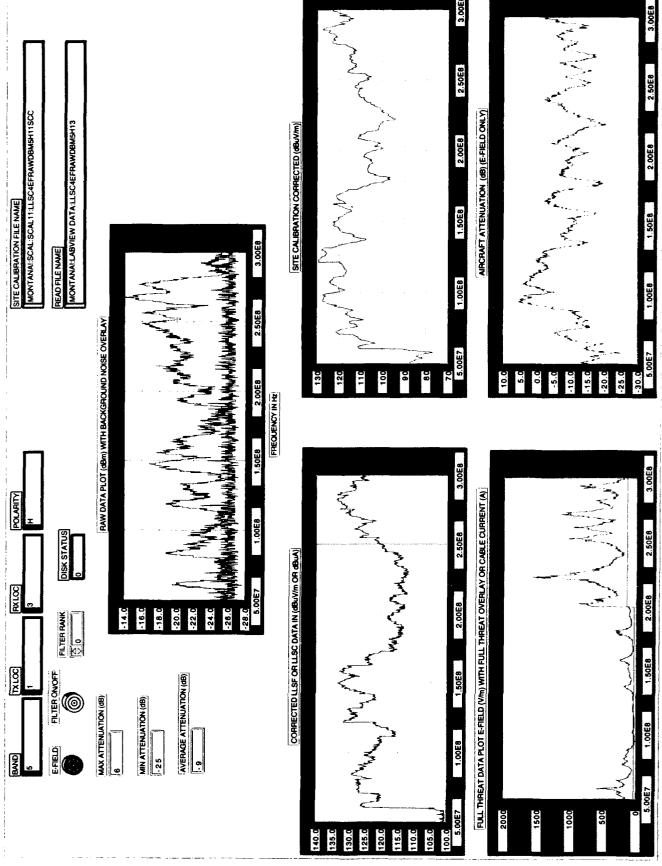
SECTION 1-1 CO-PILOT SEAT LLSF DATA PLOTS

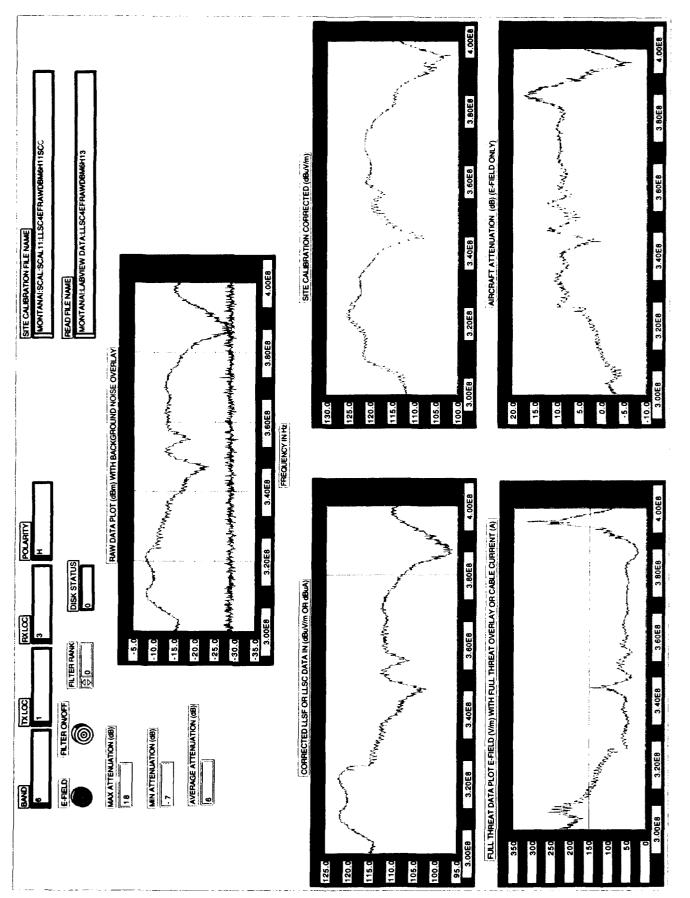


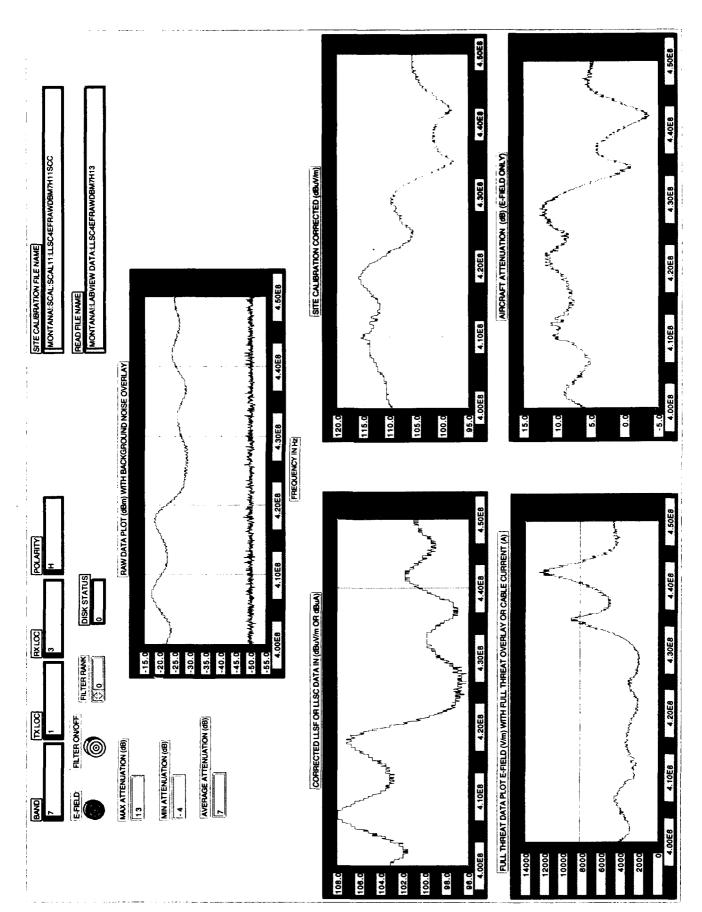


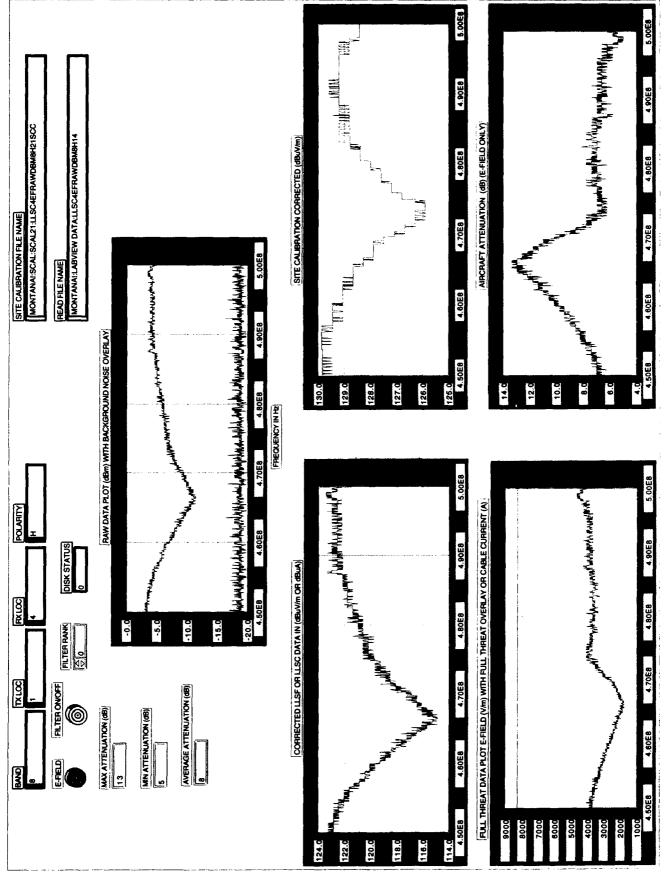


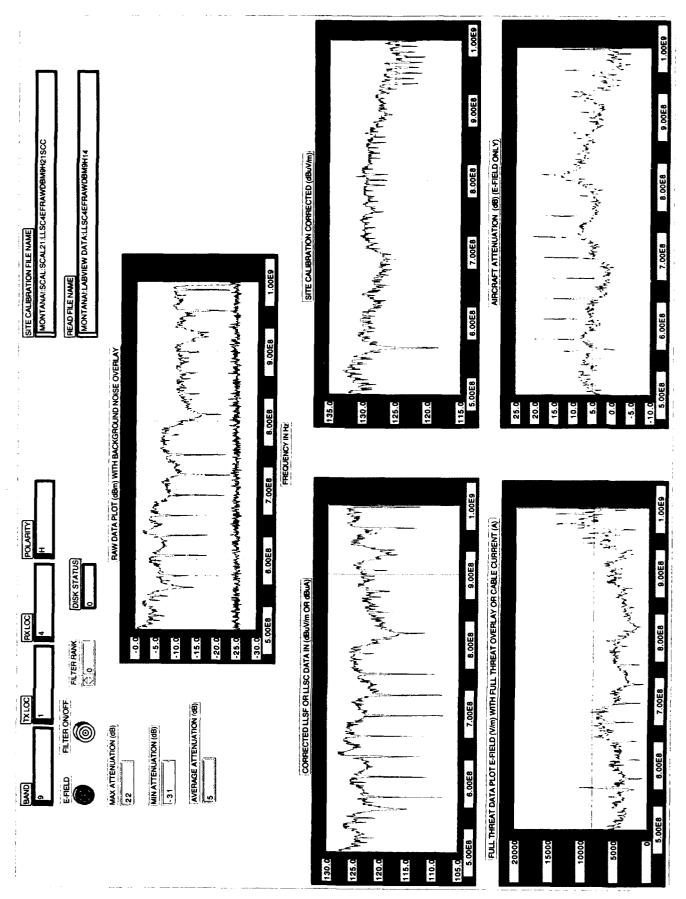


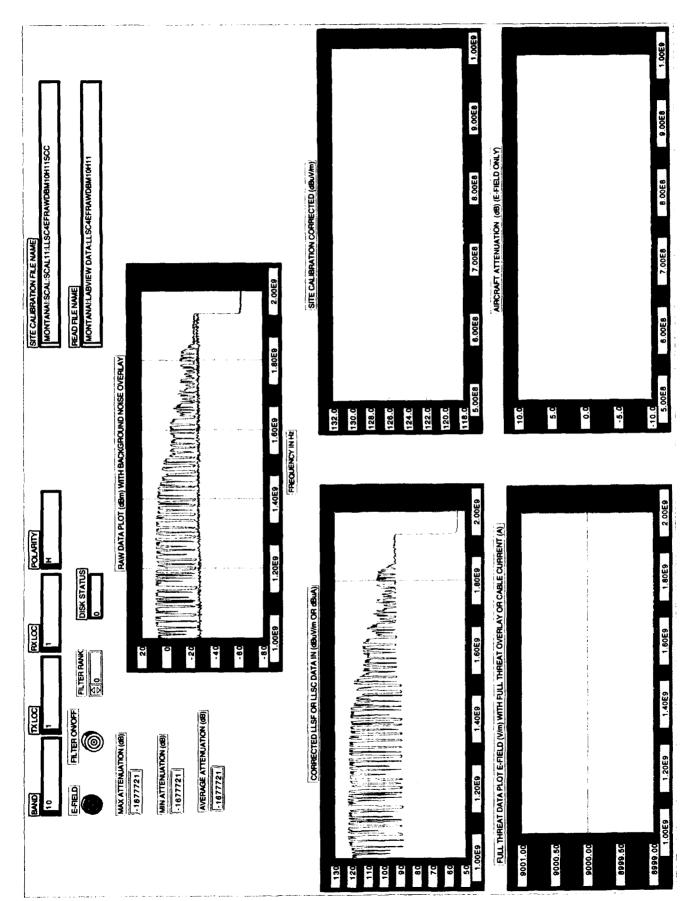


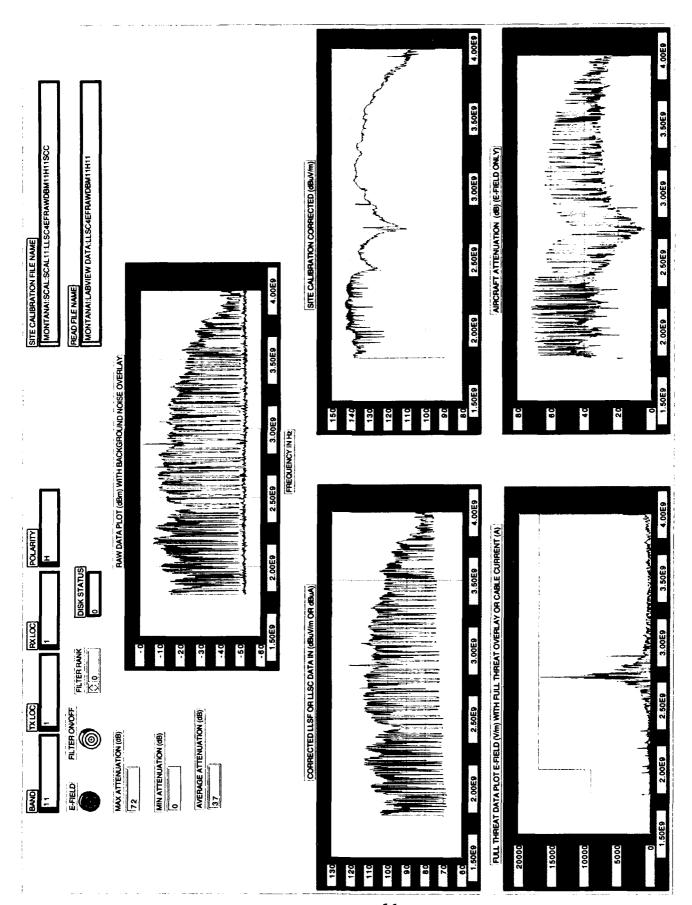


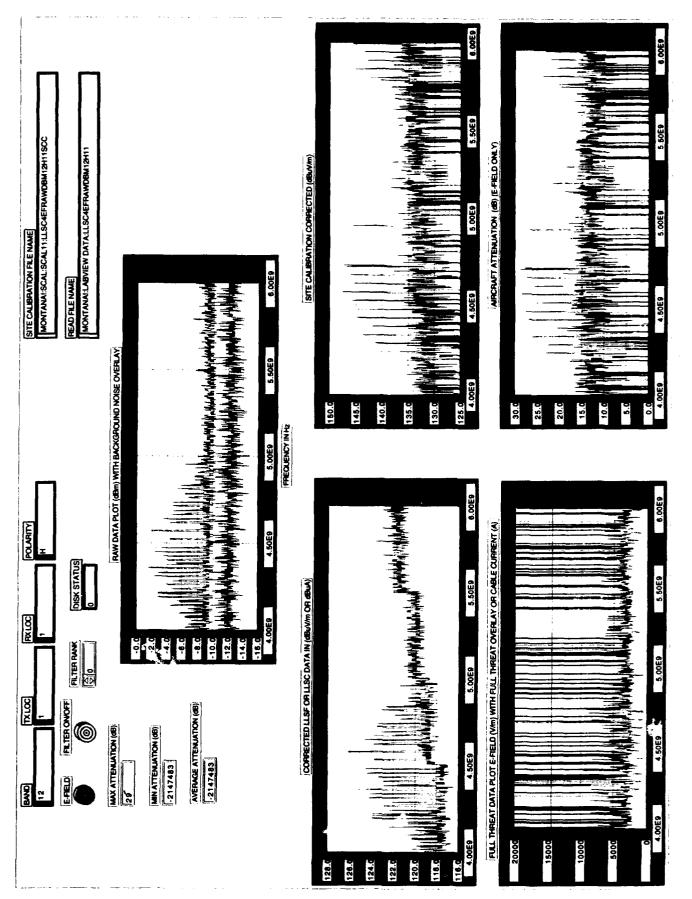


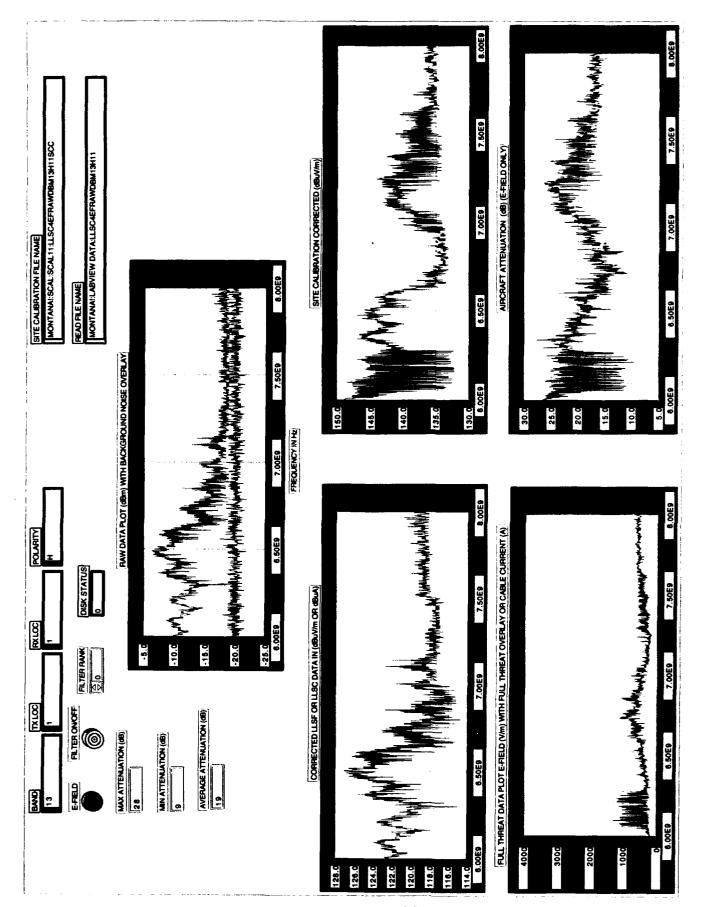


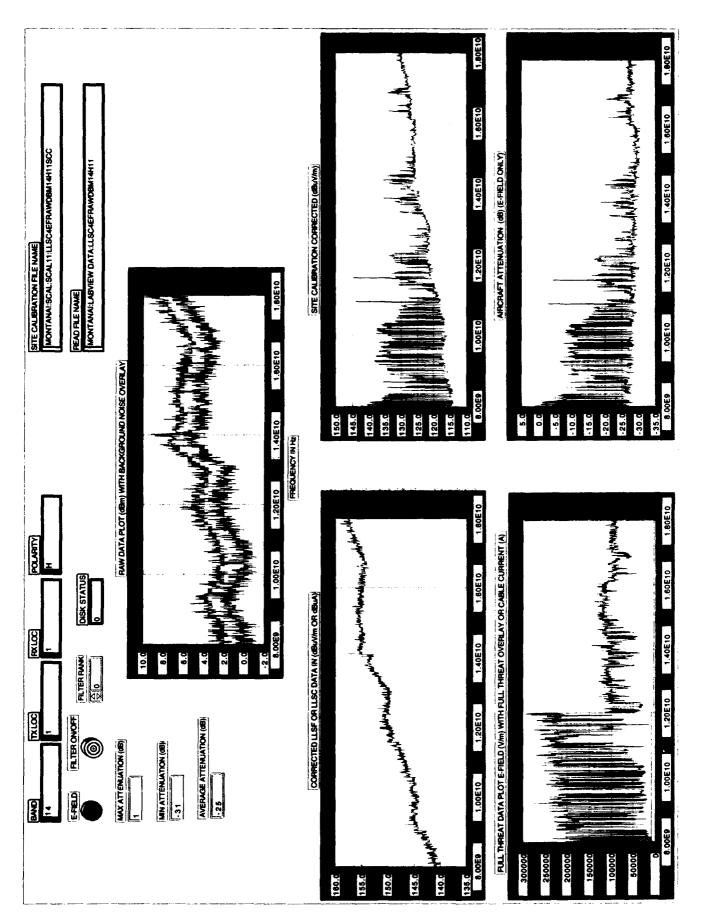


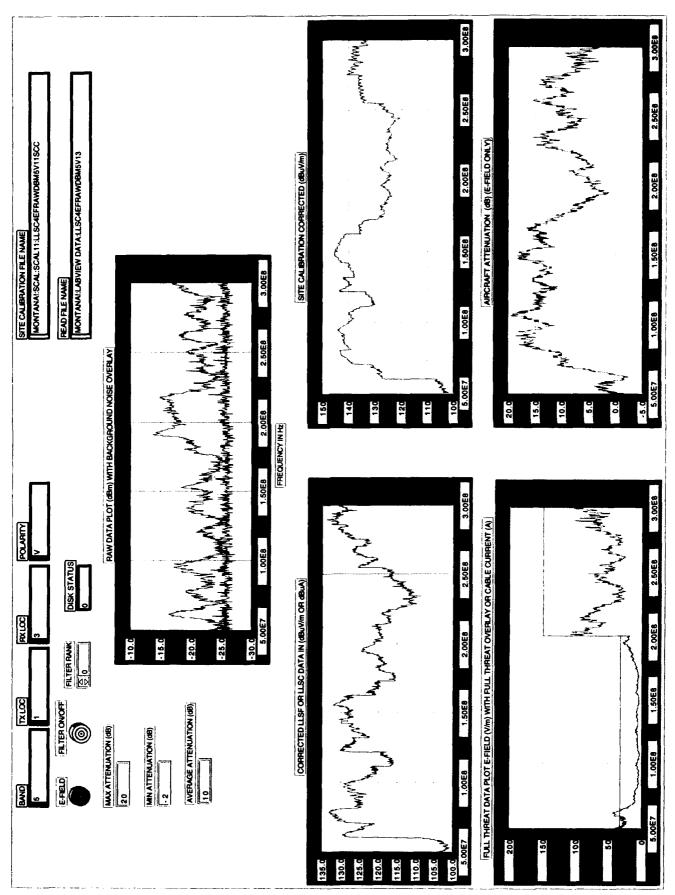


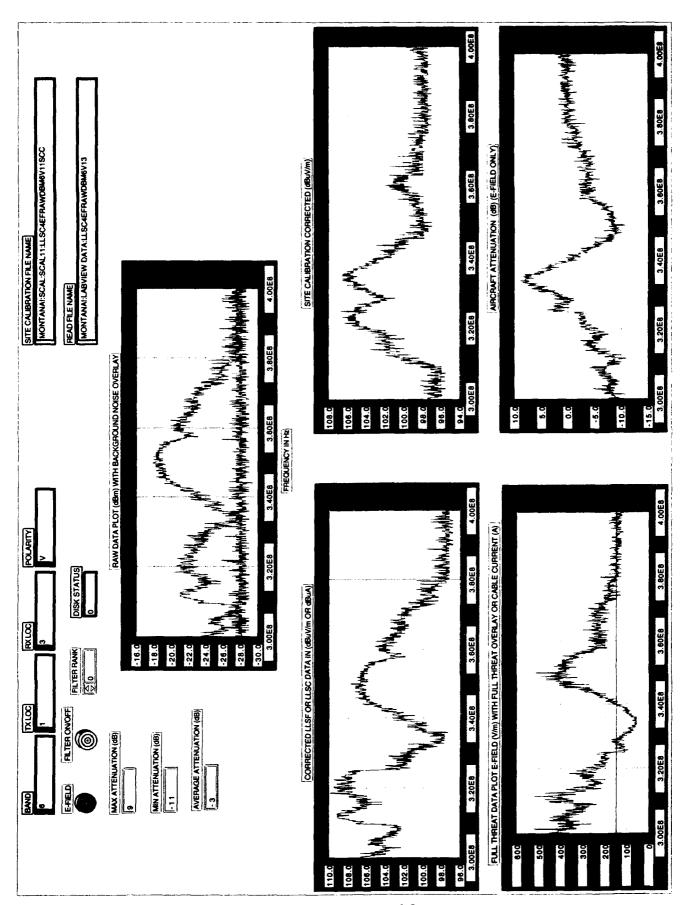


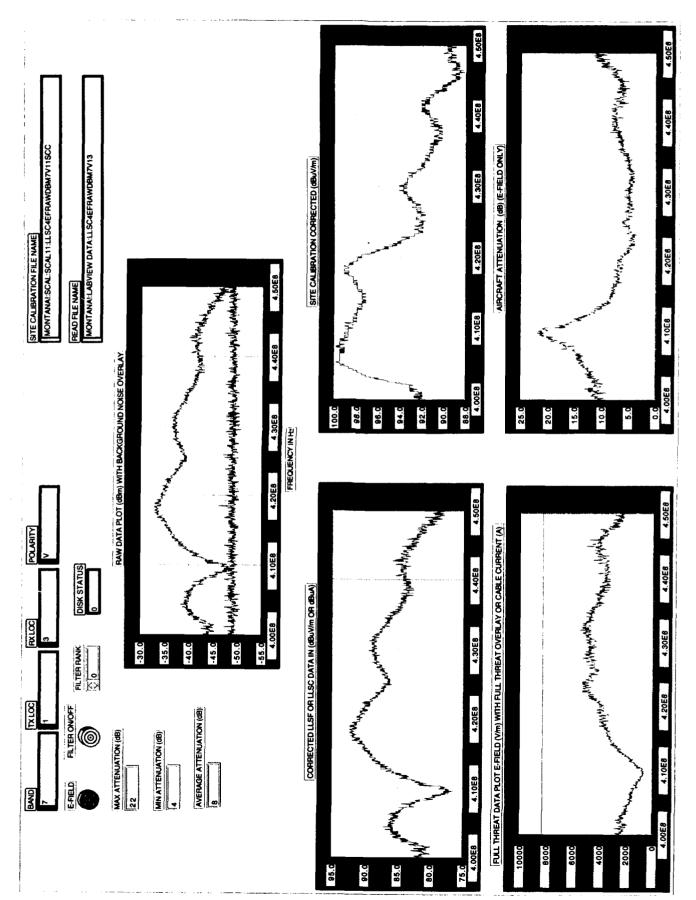


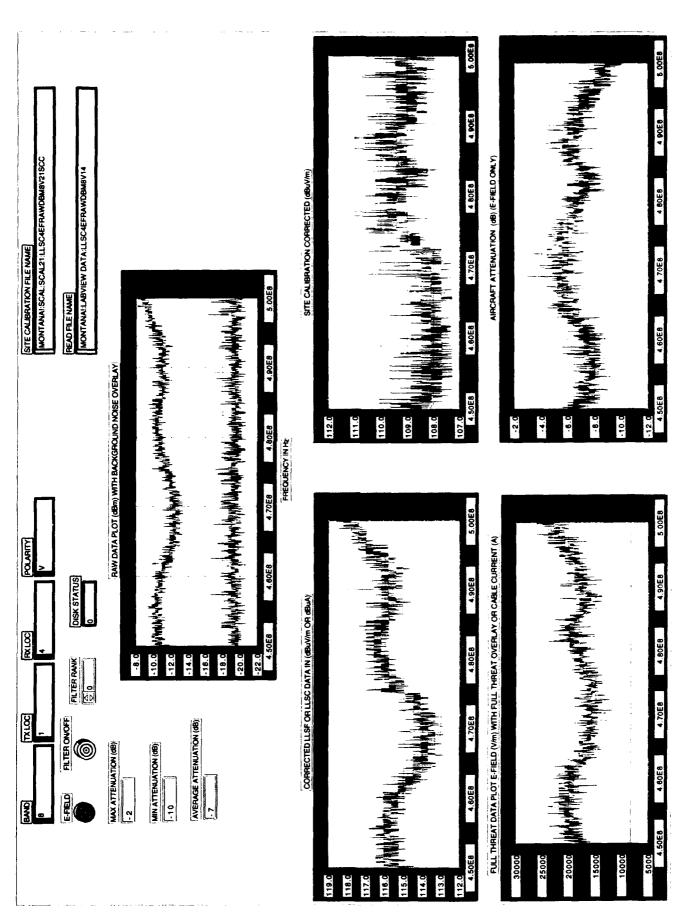


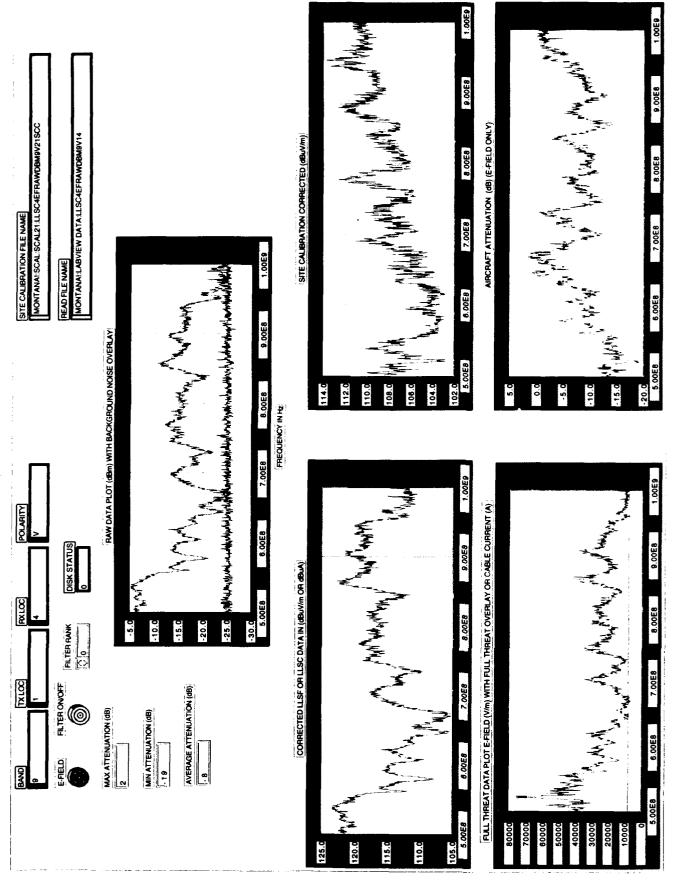


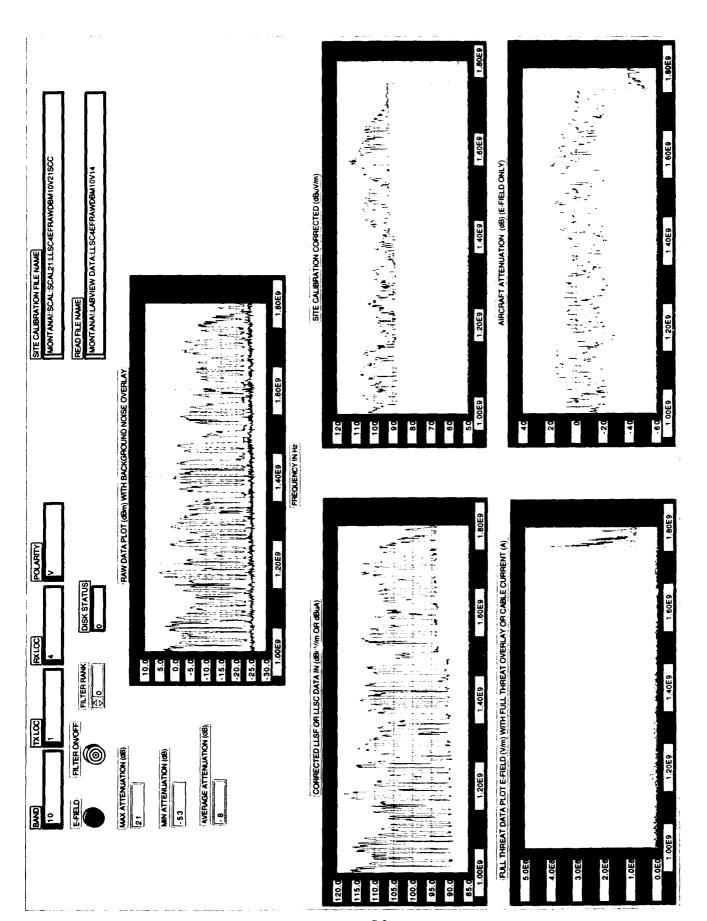


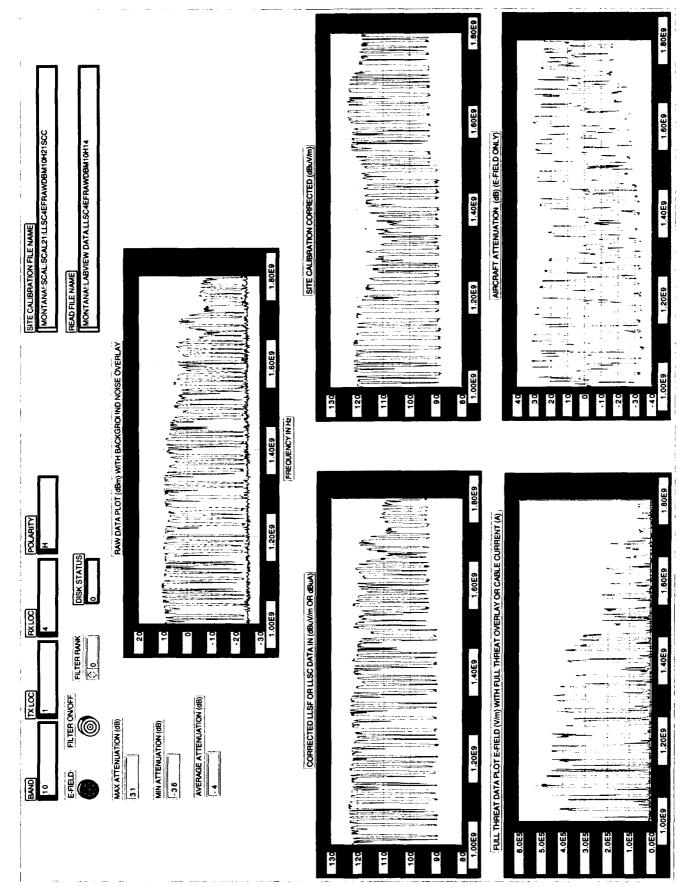


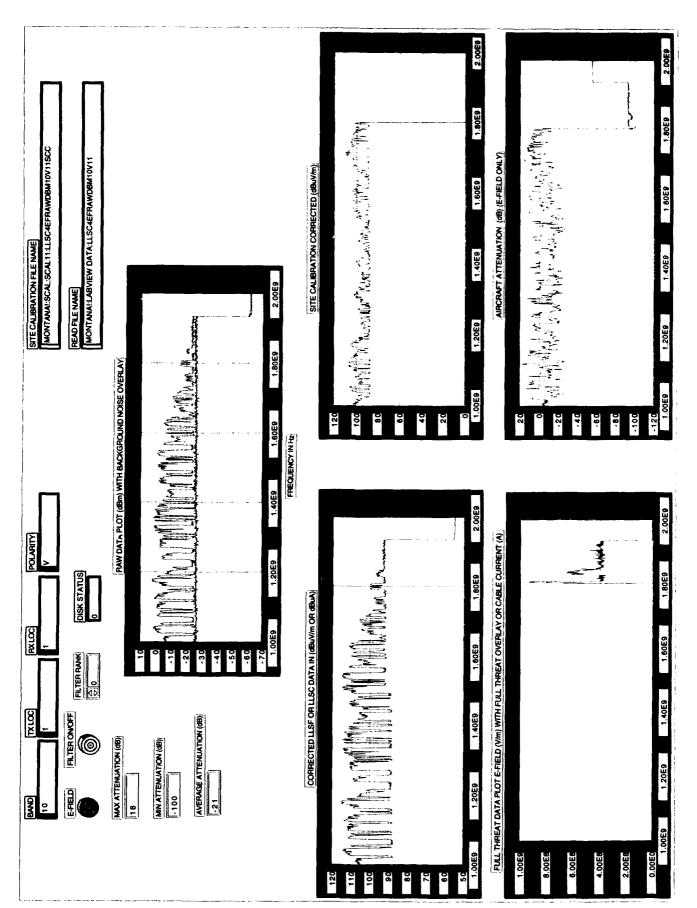


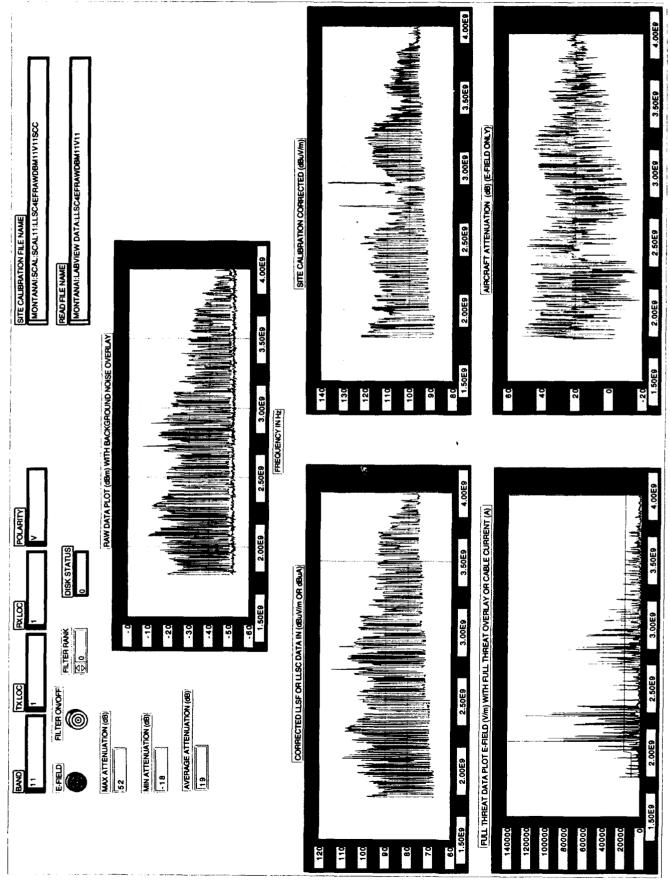


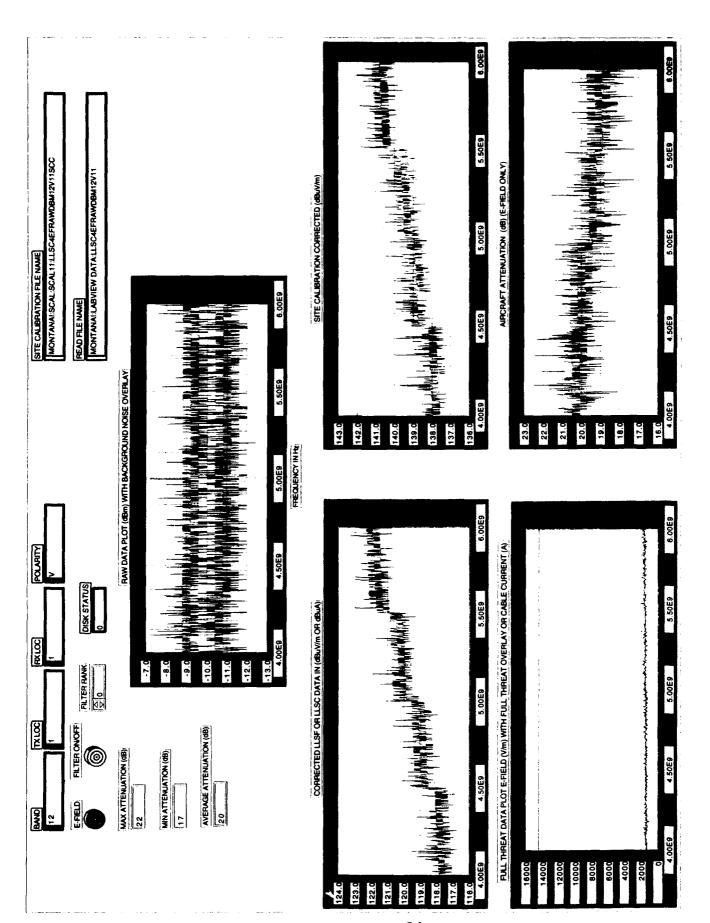


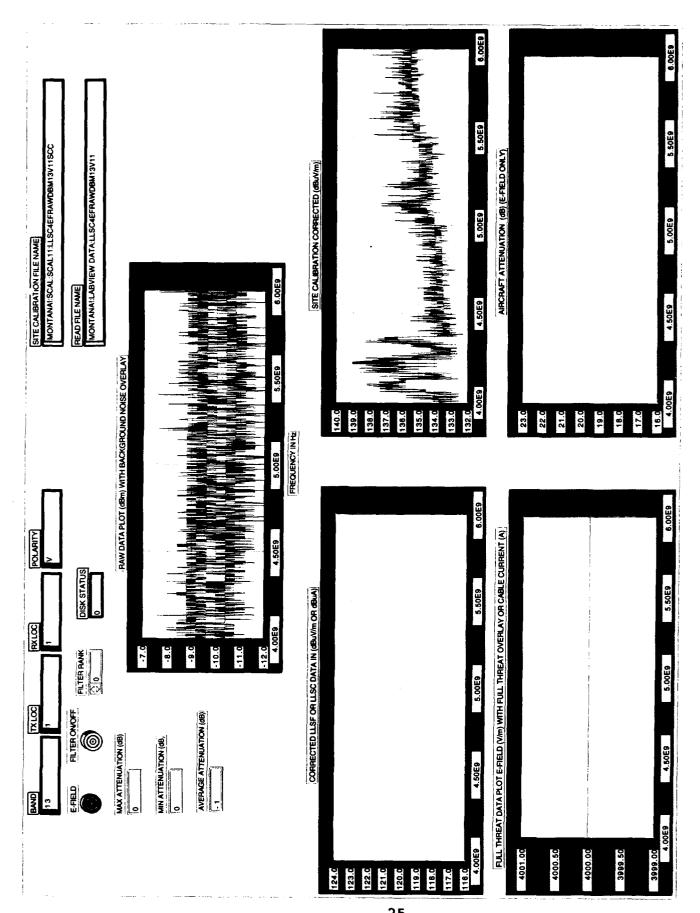


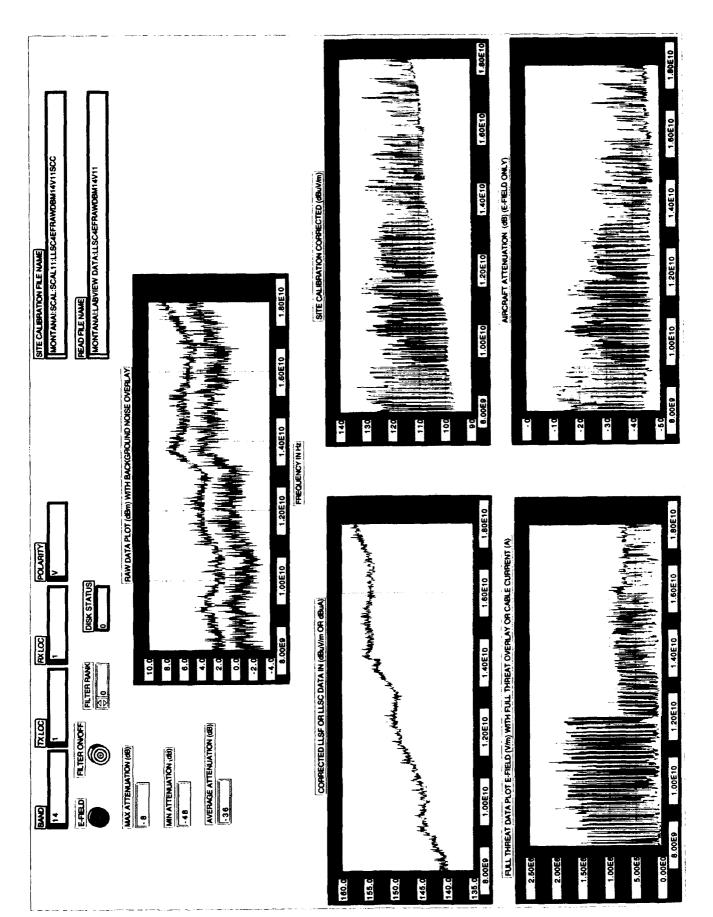


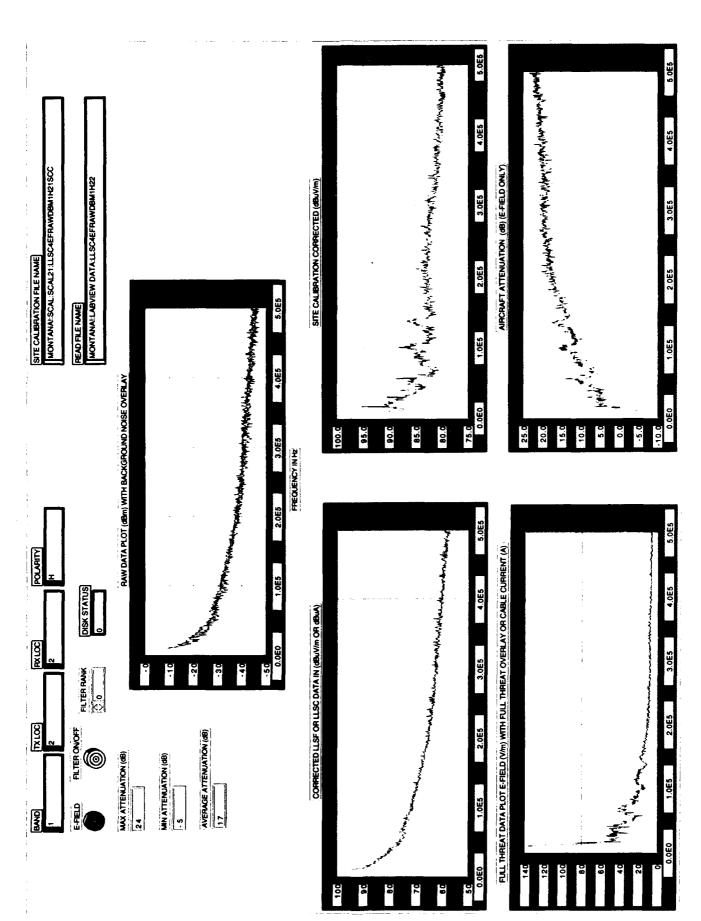


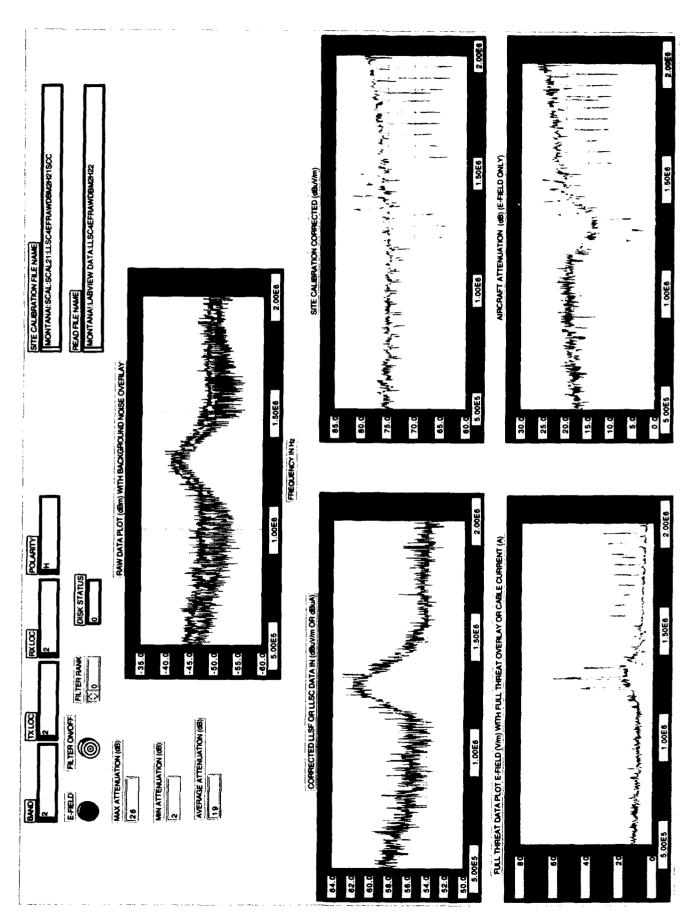


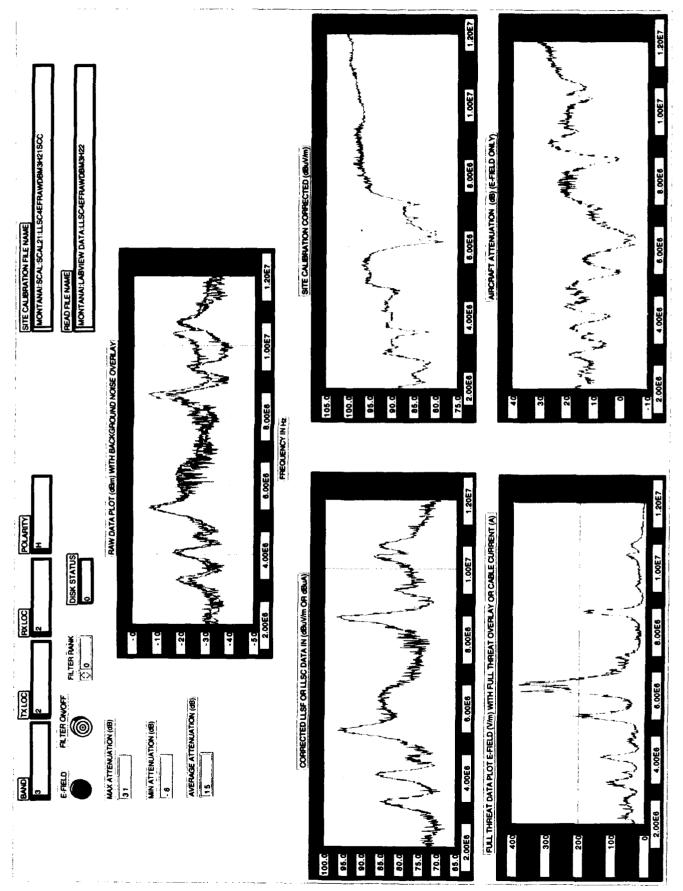


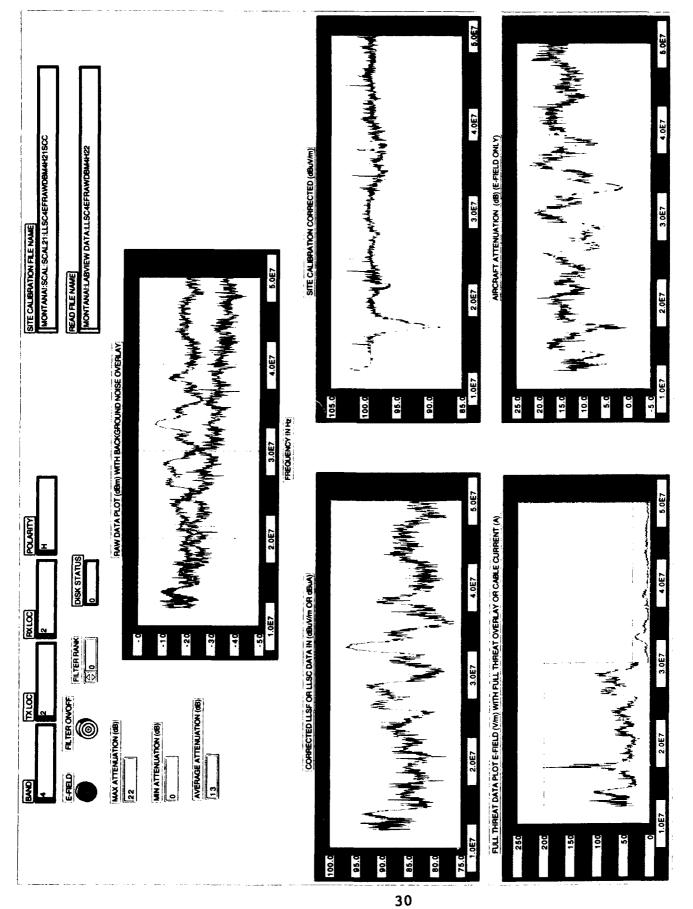


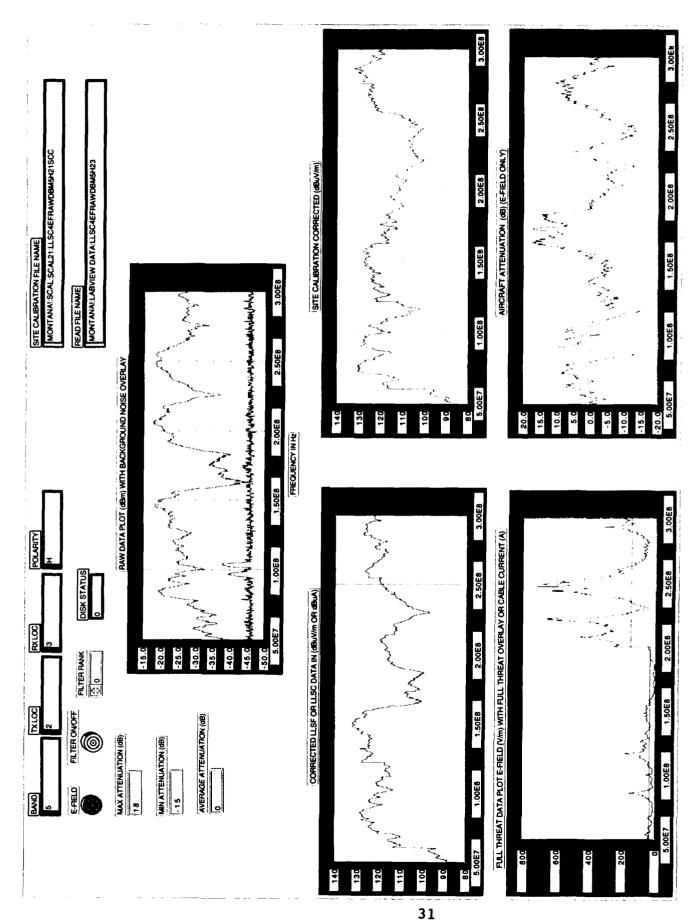


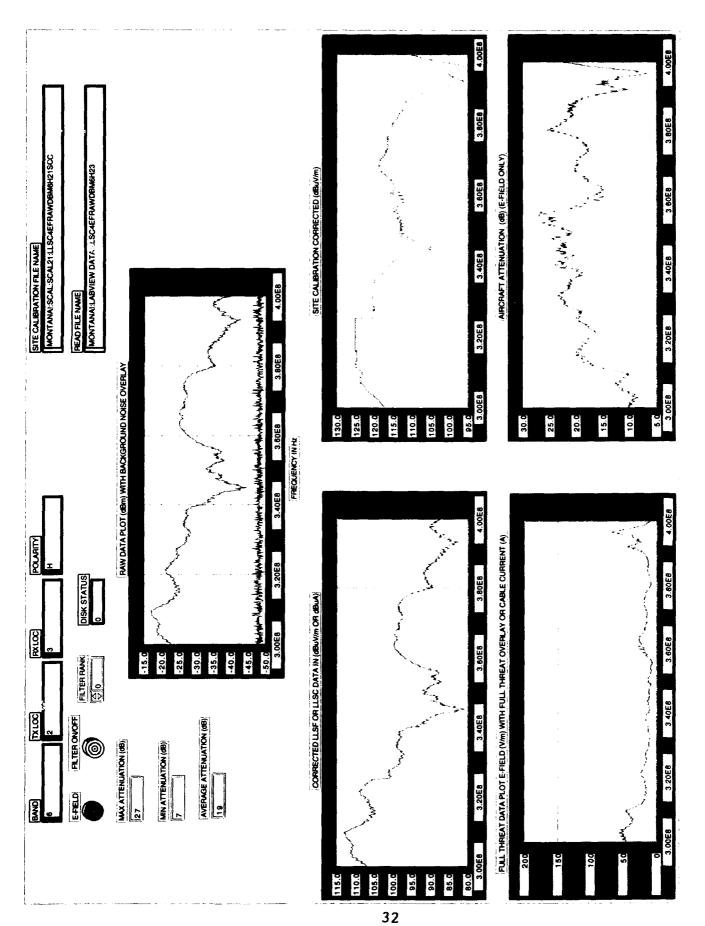


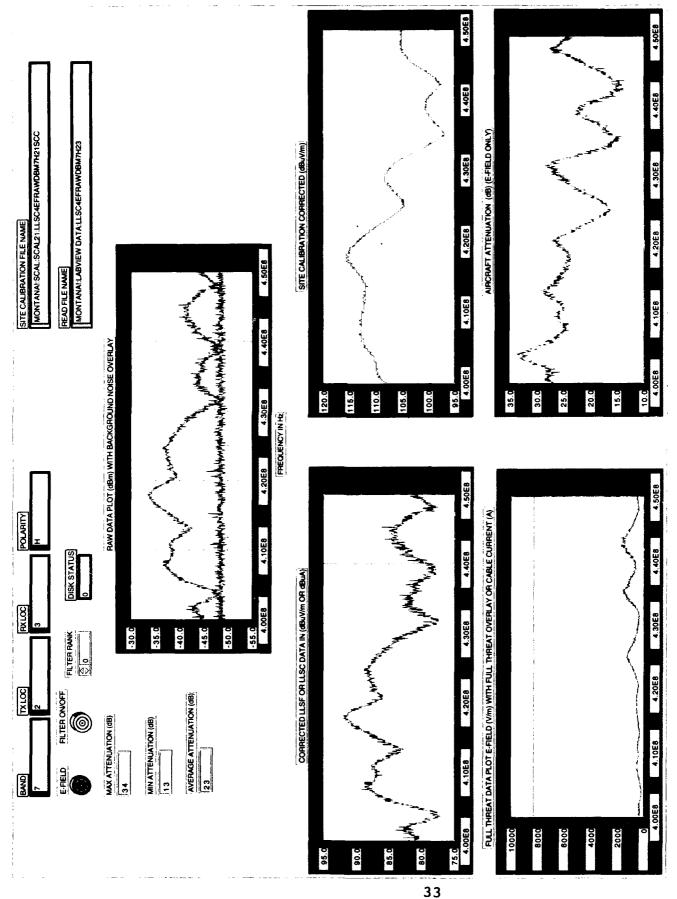


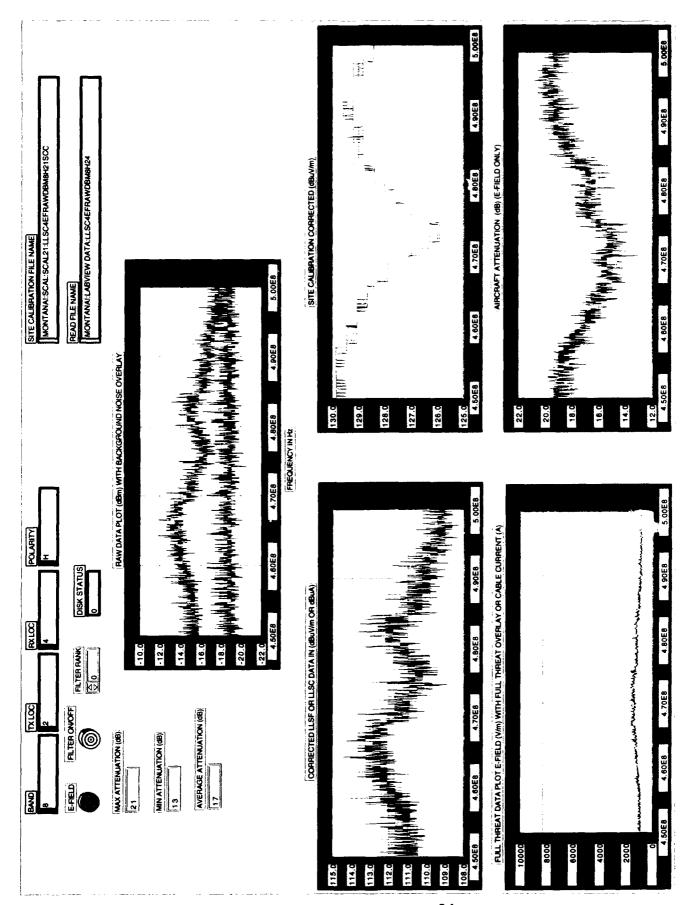


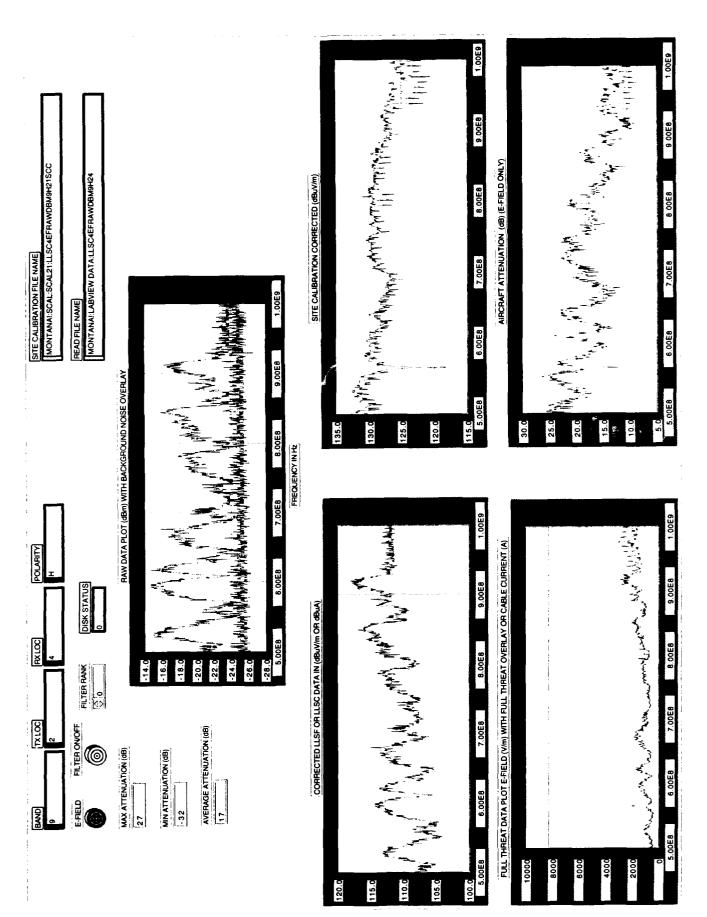


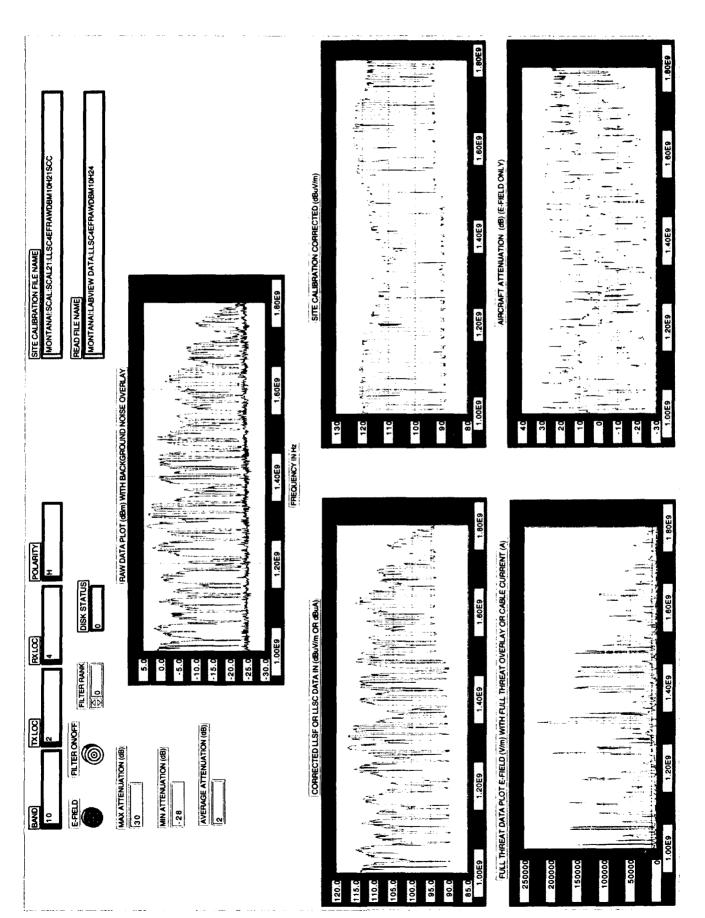


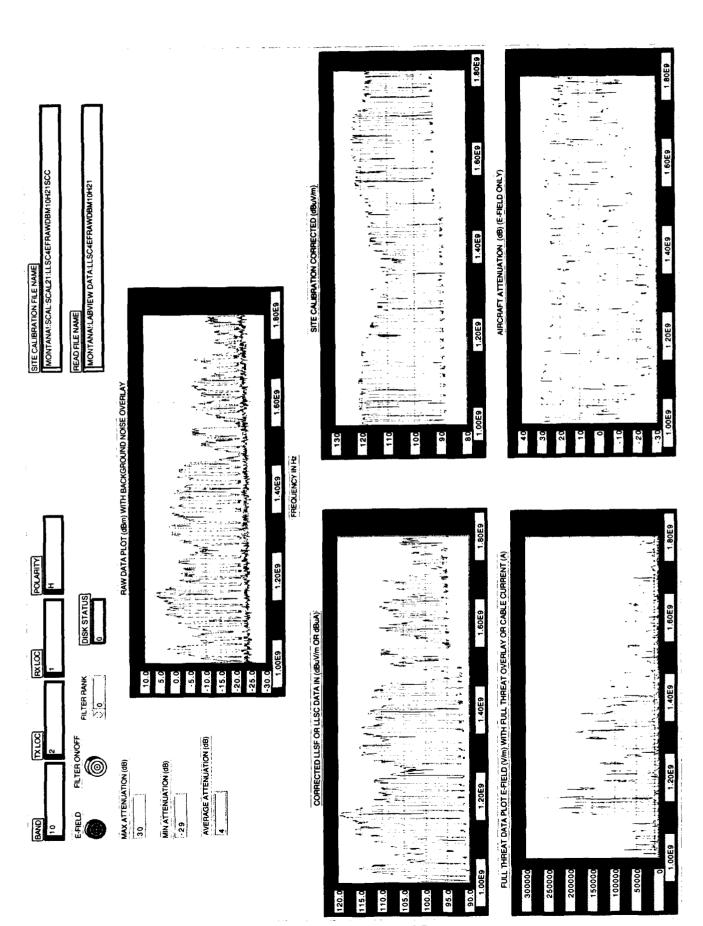


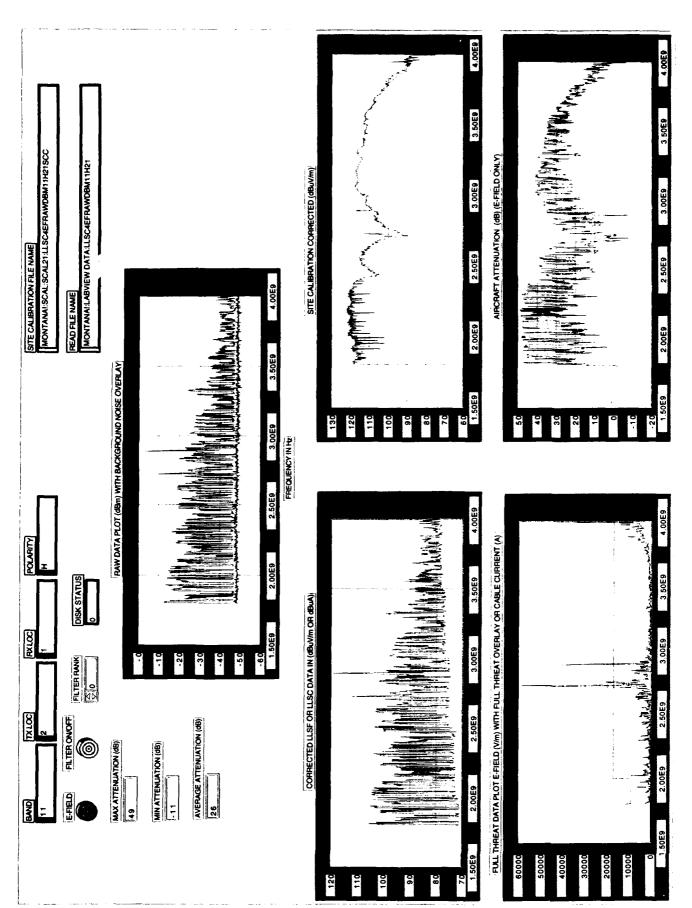


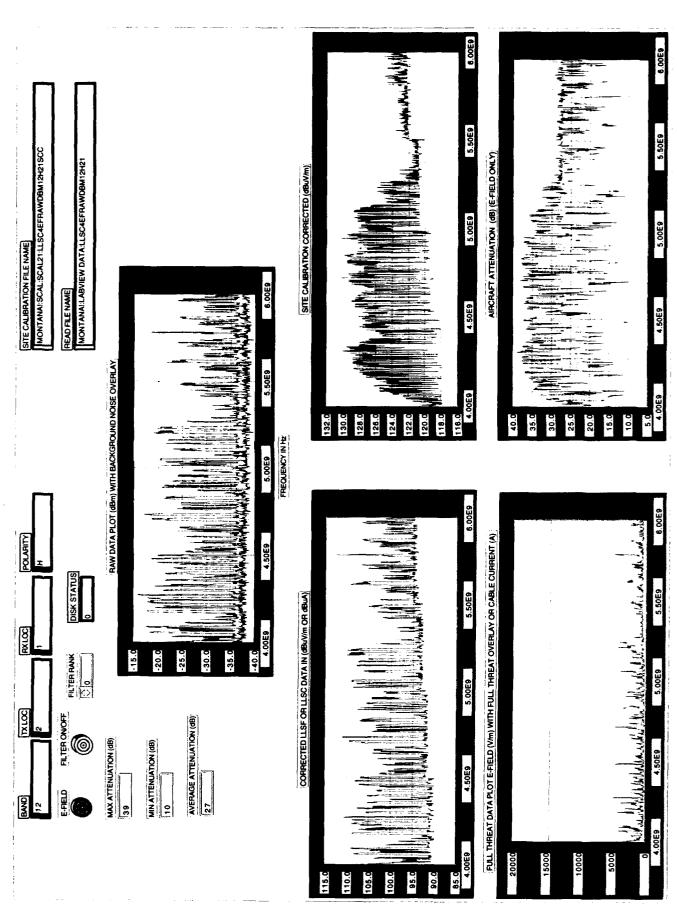


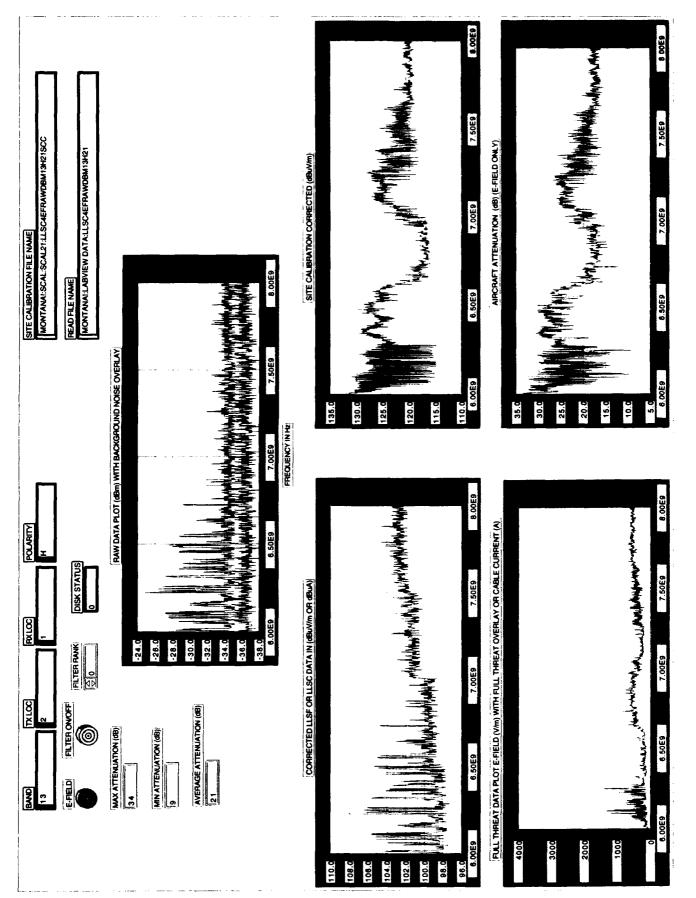


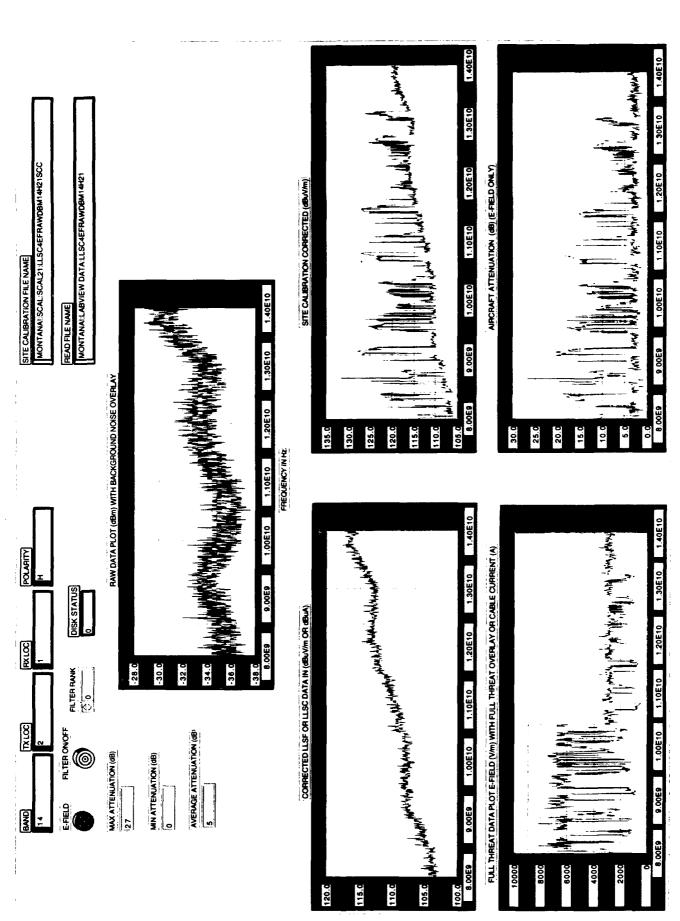


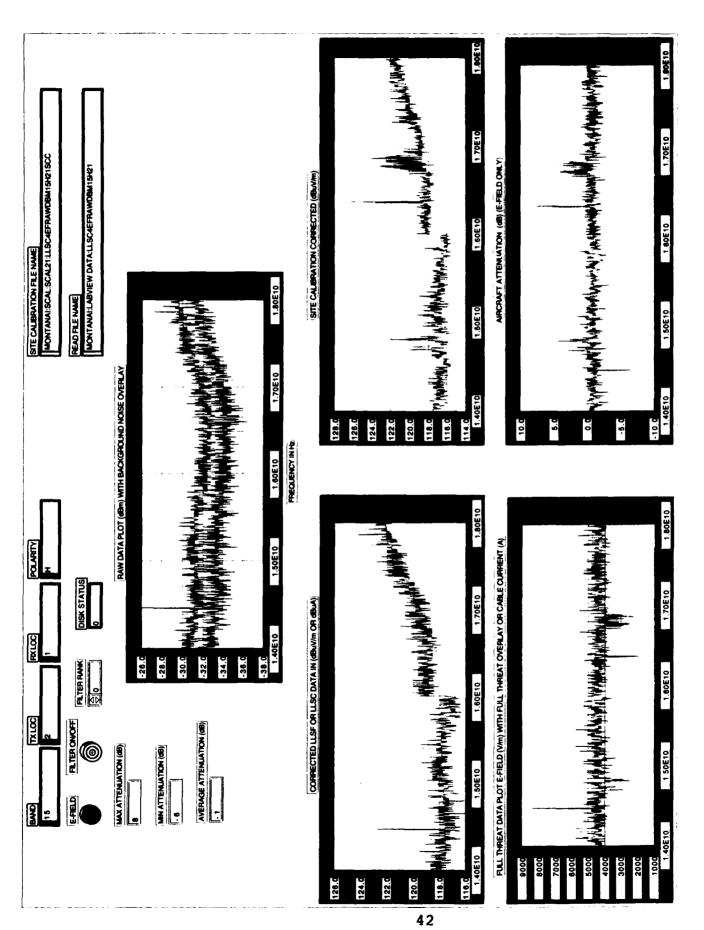


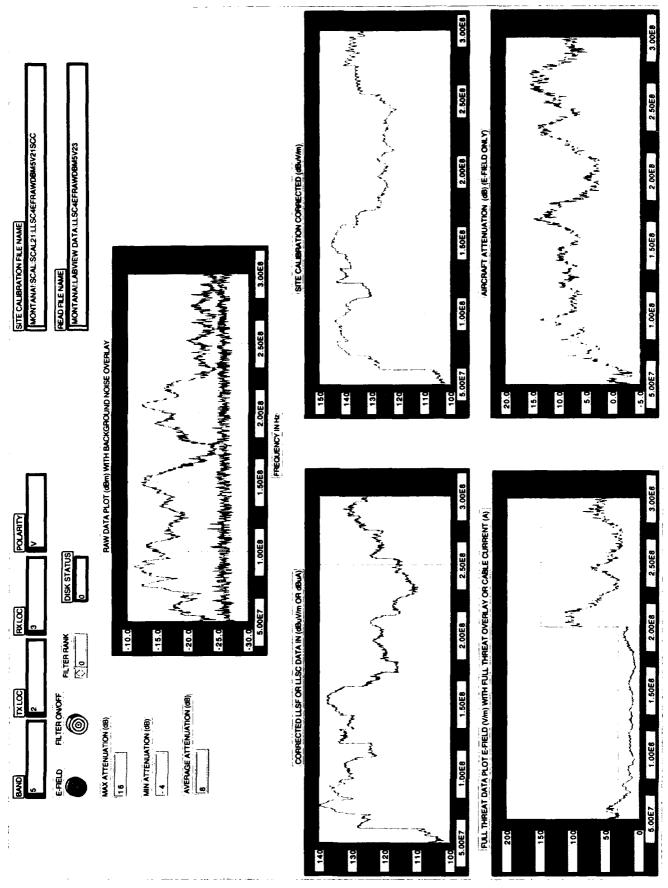


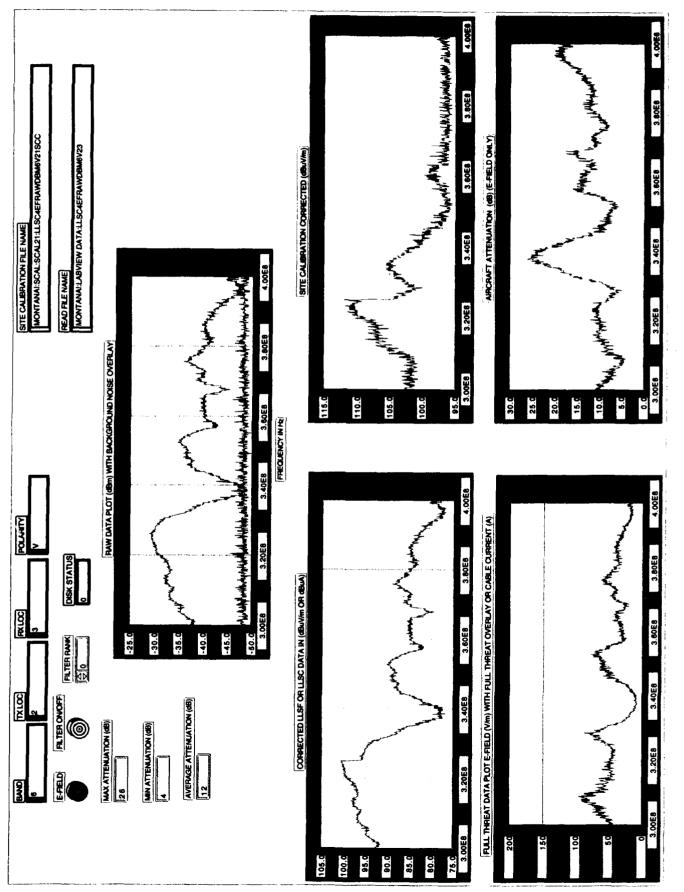


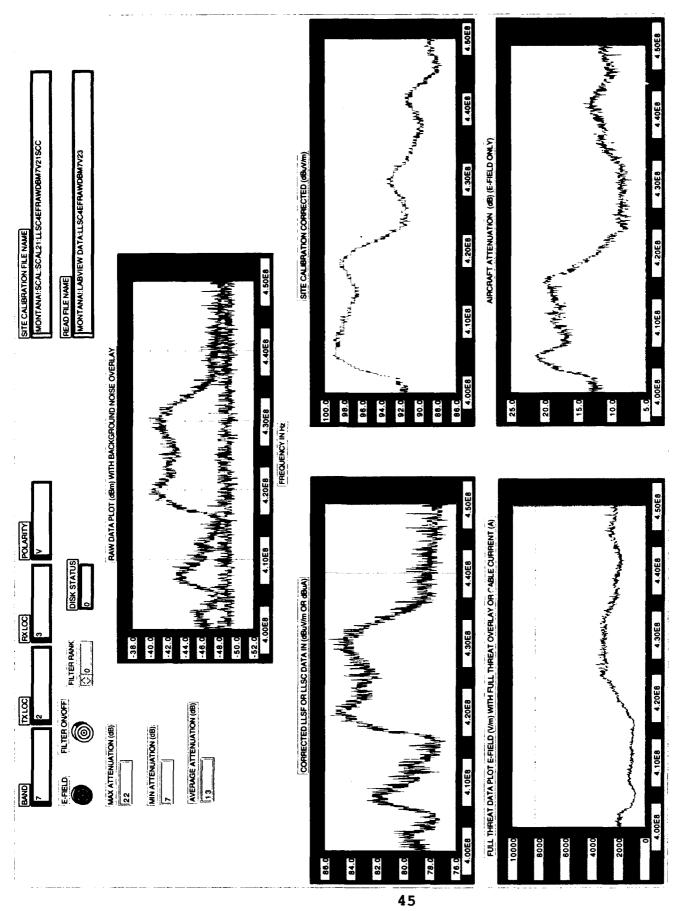


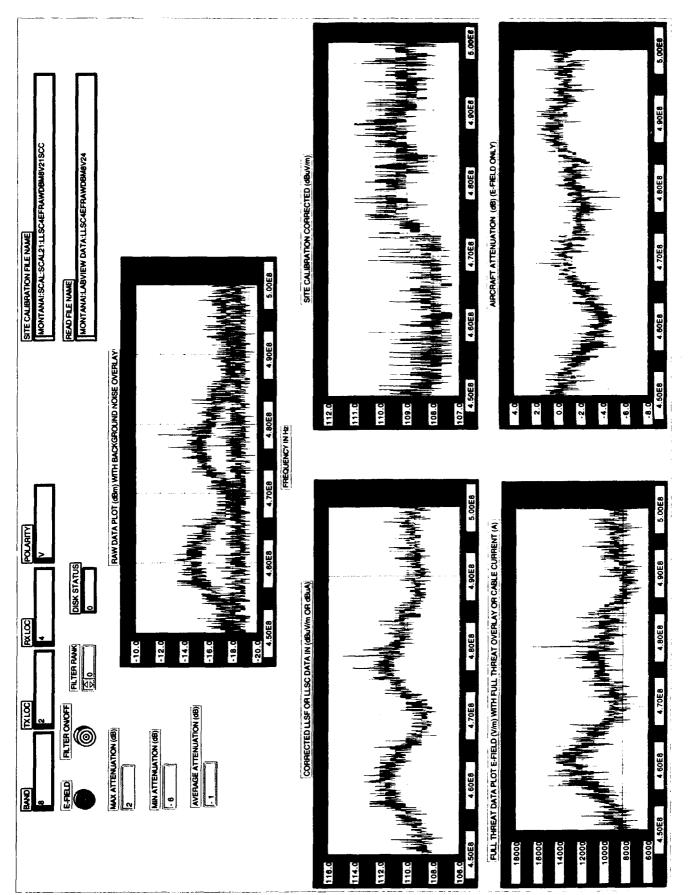


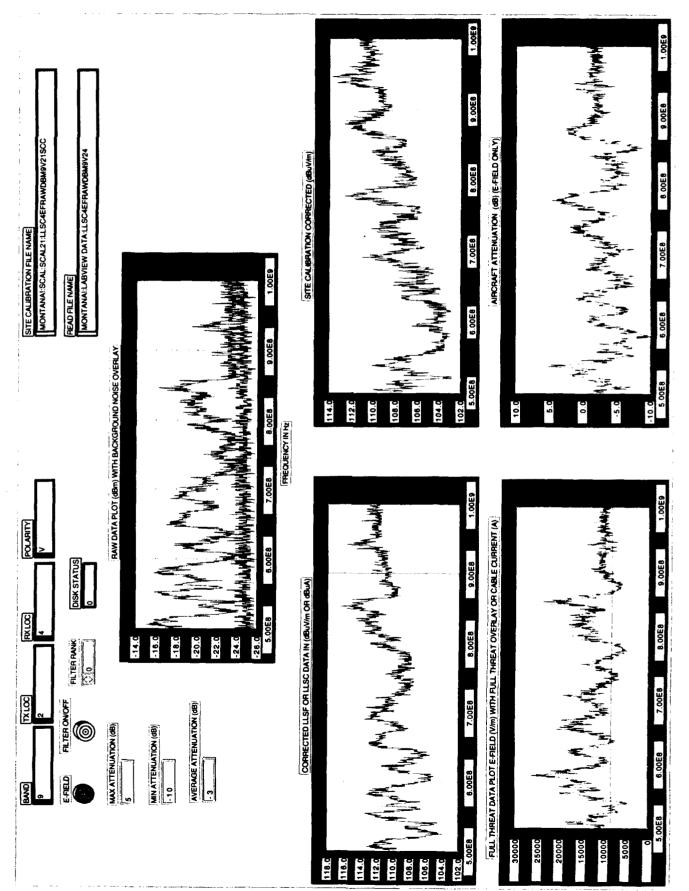


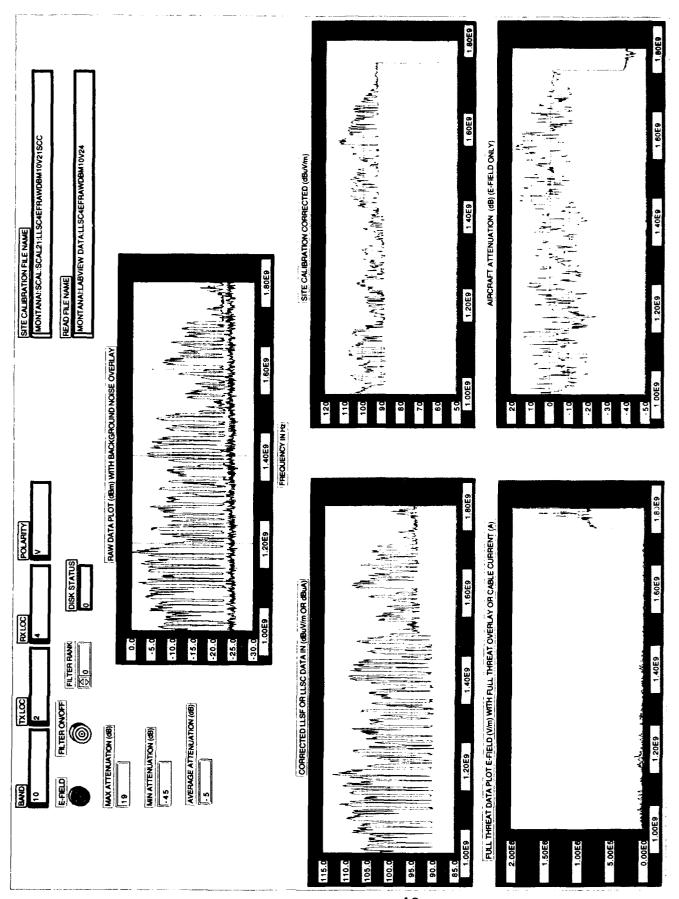


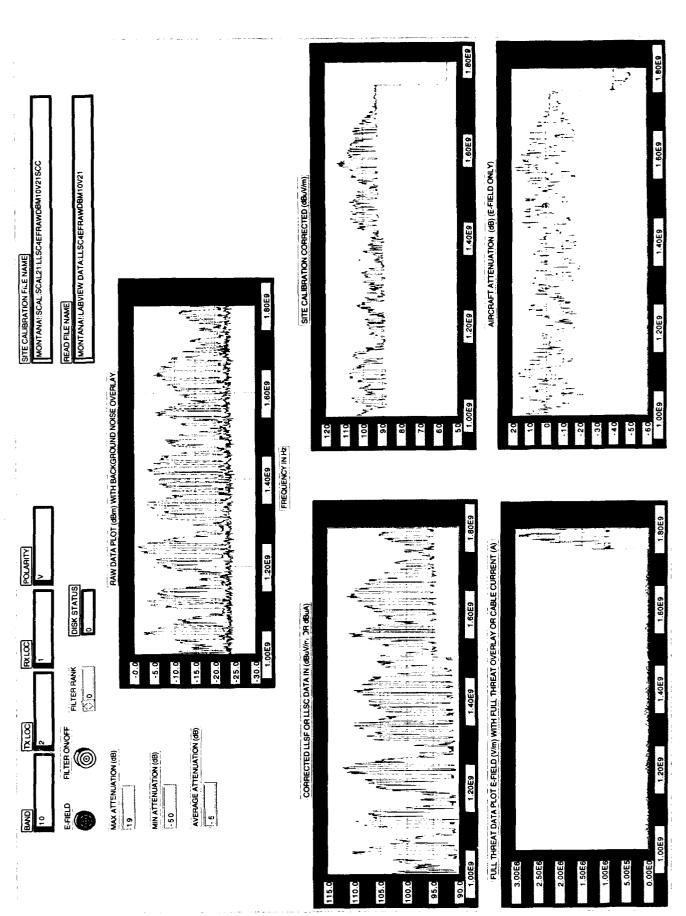


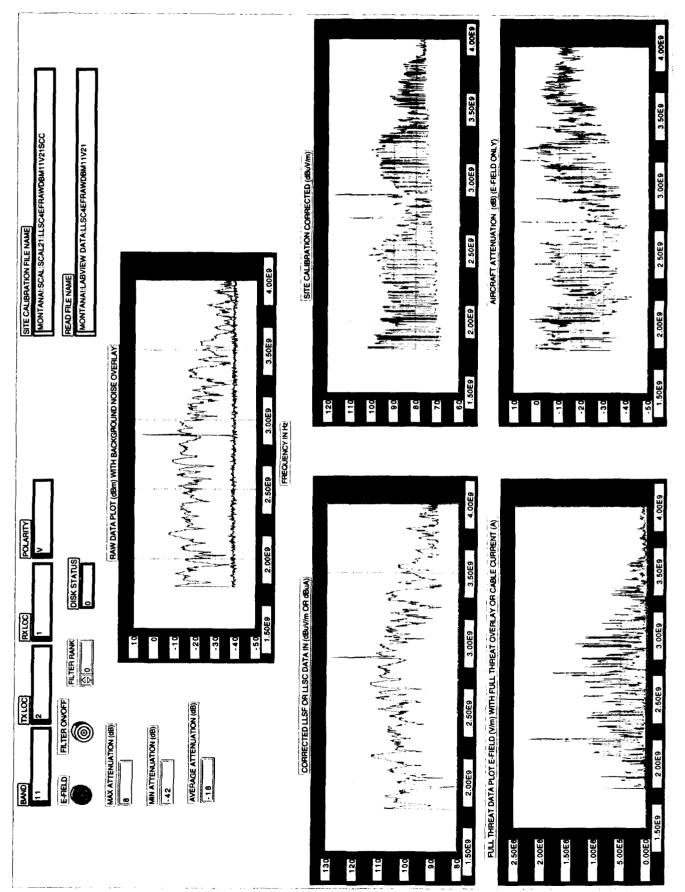


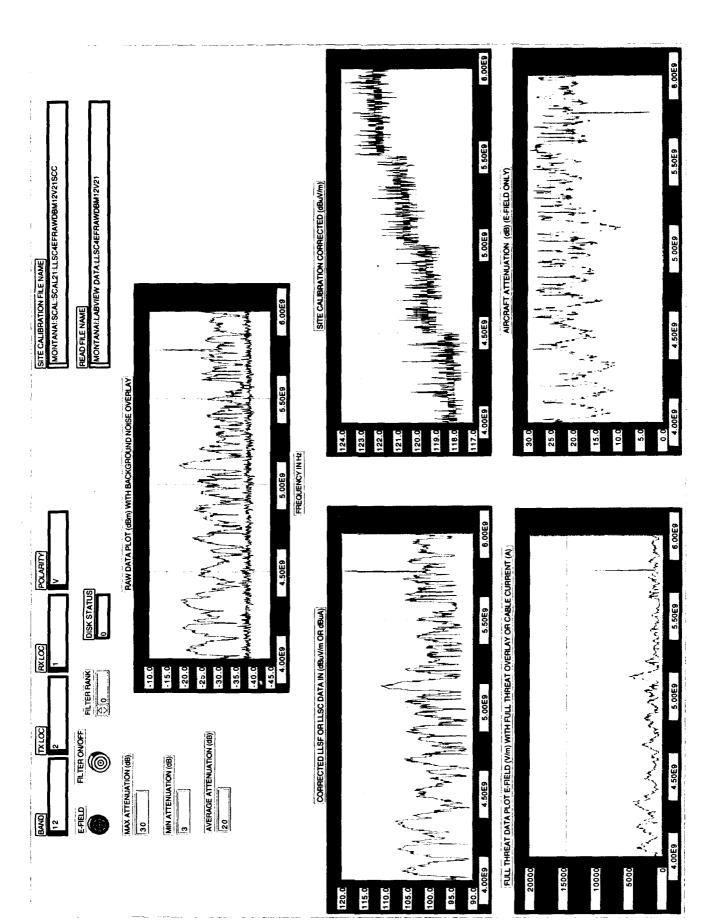


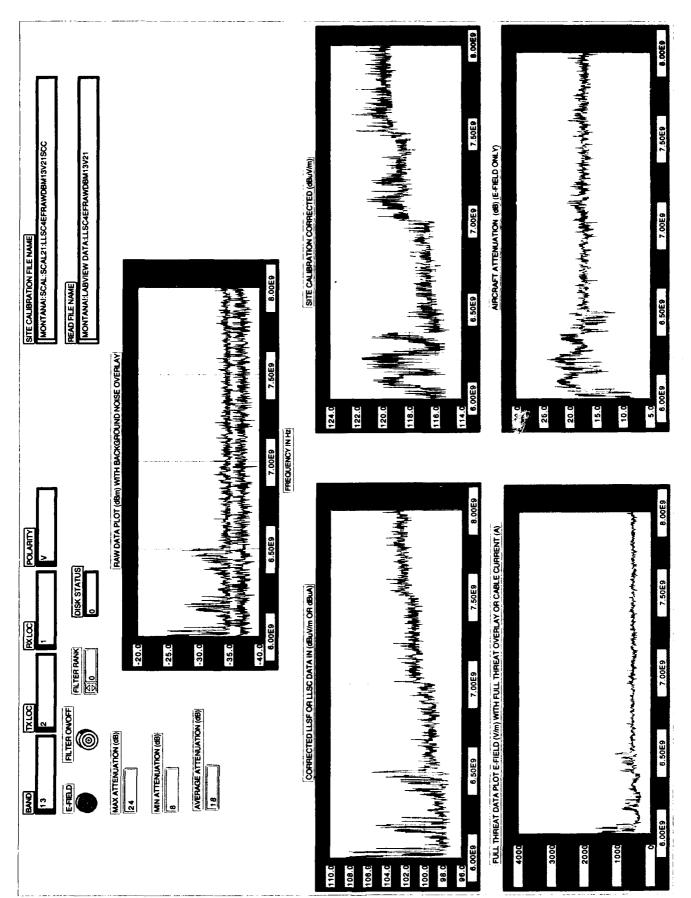


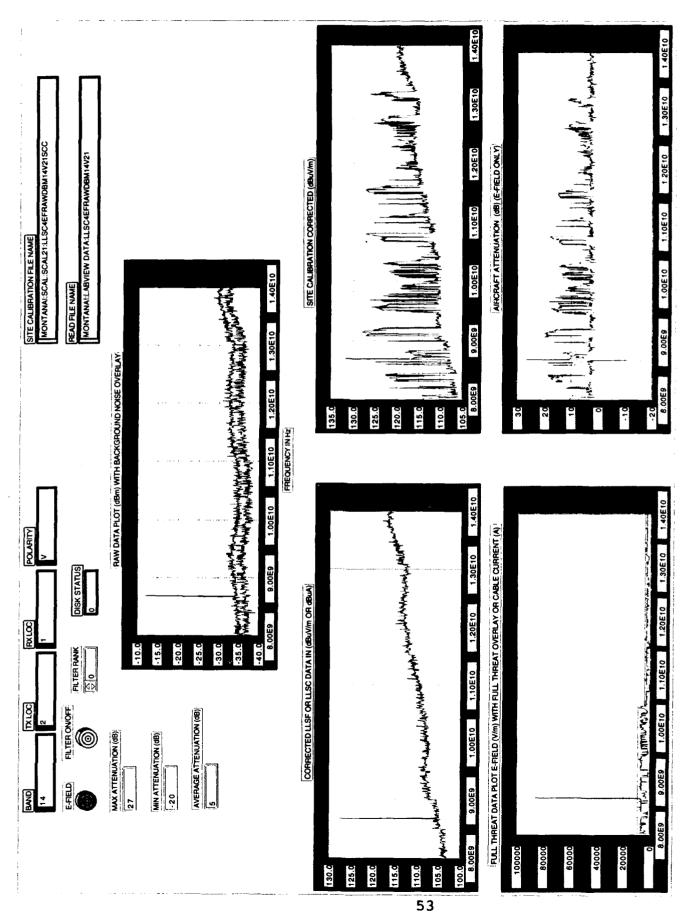


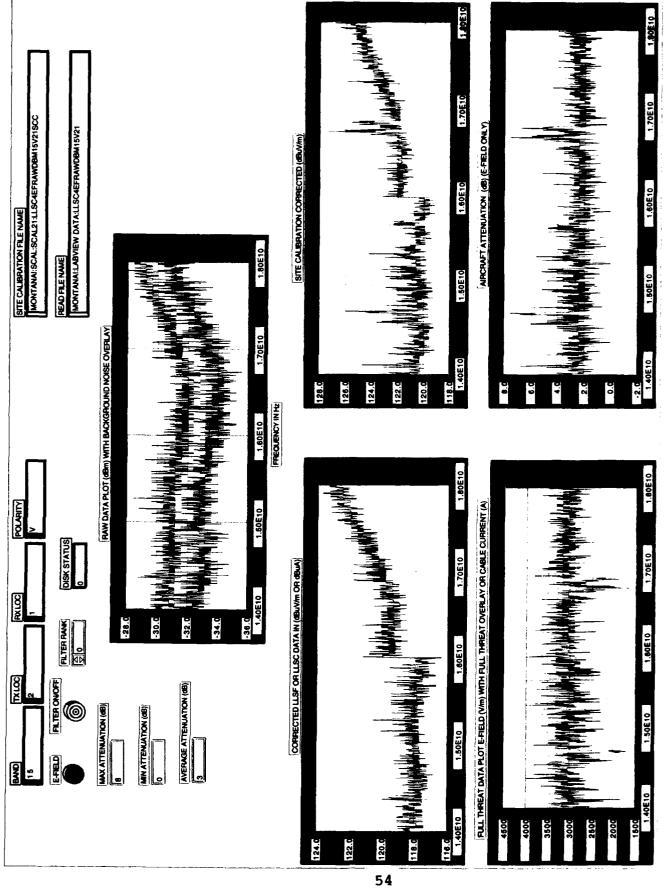




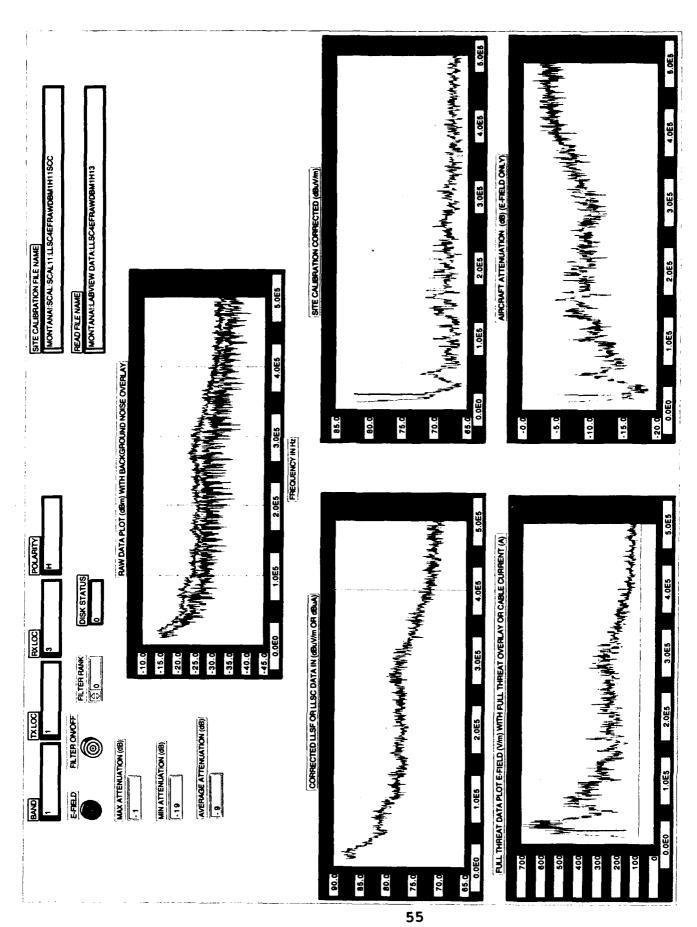


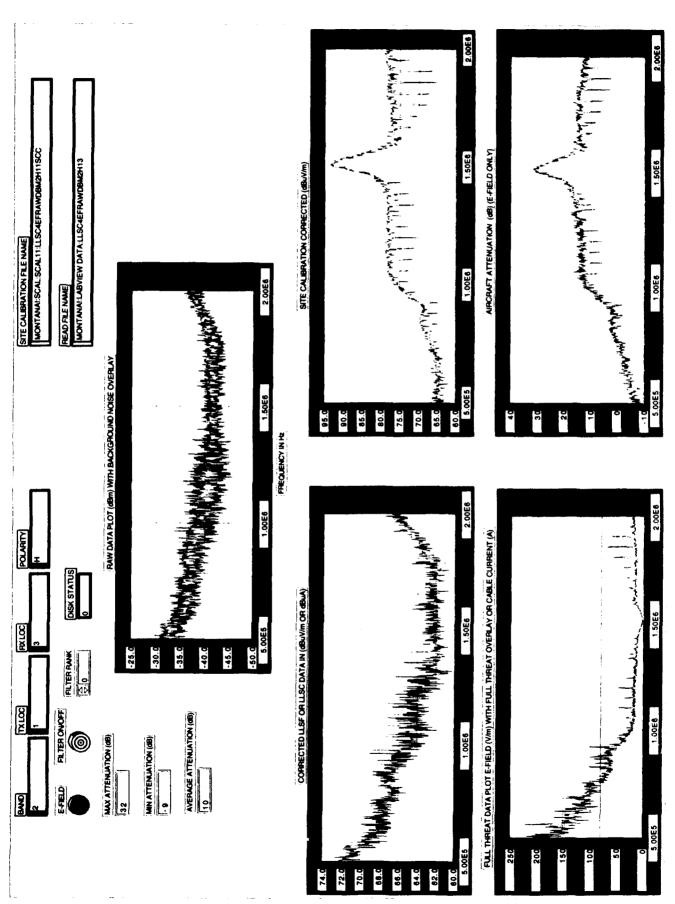


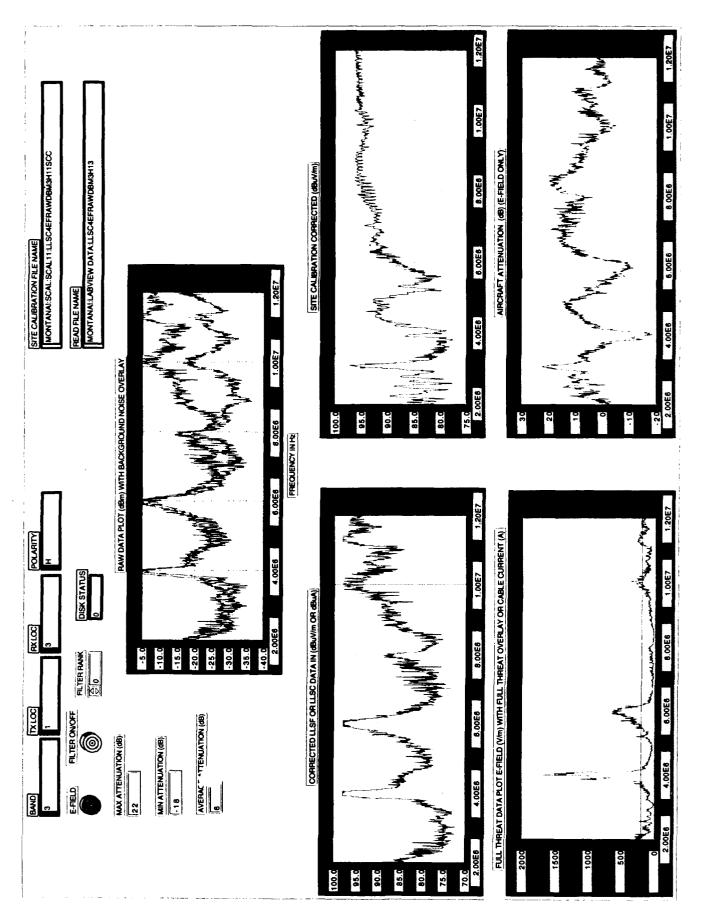


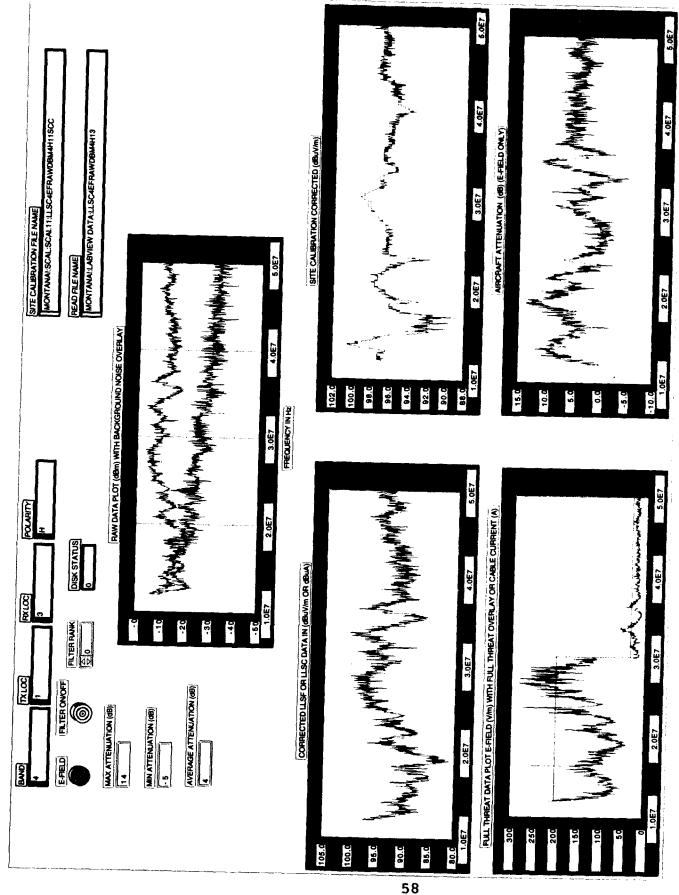


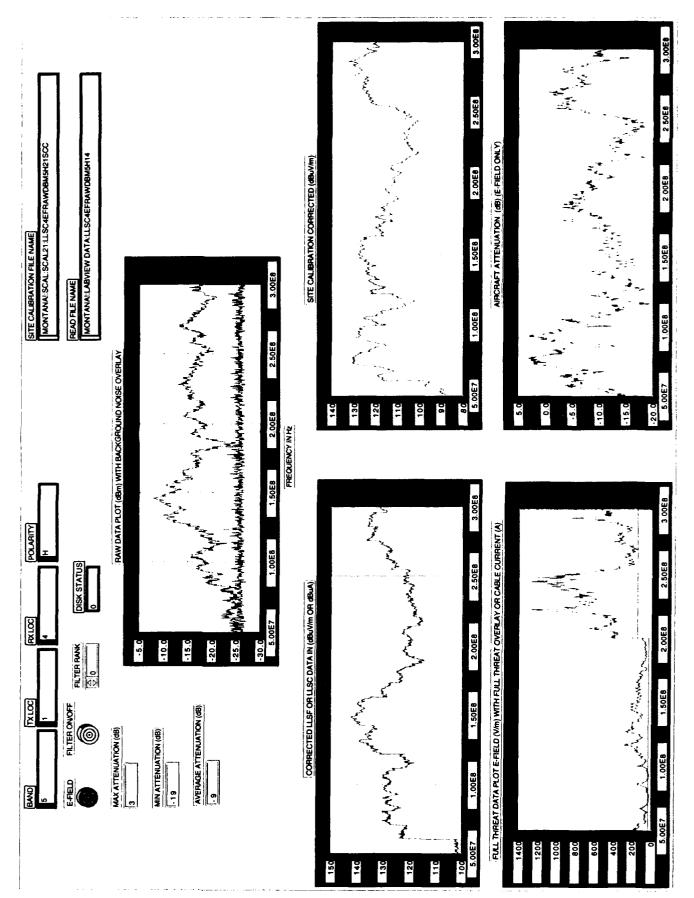
SECTION 1-2 PILOT SEAT LLSF DATA PLOTS

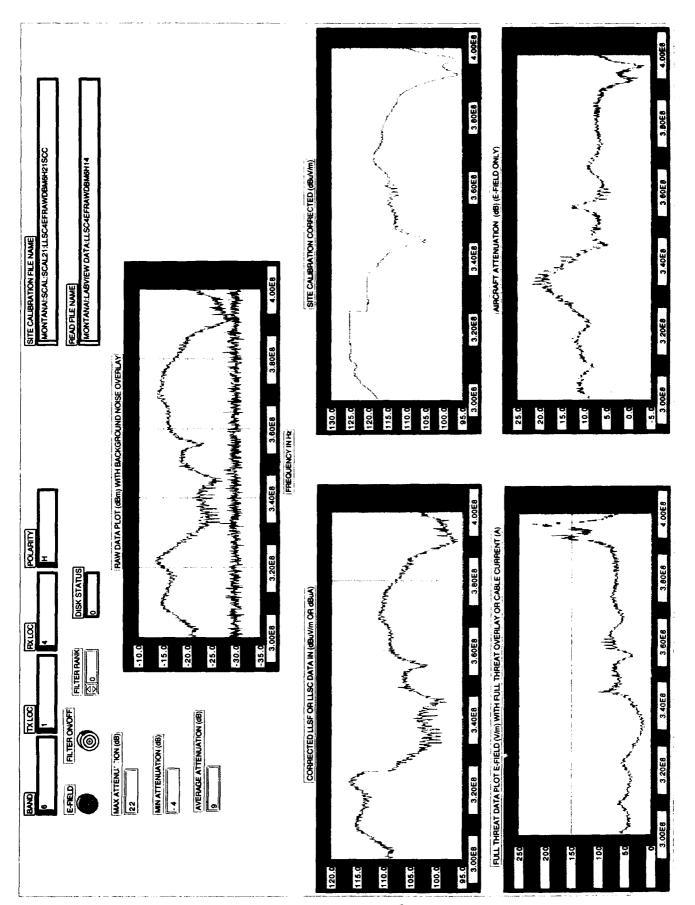


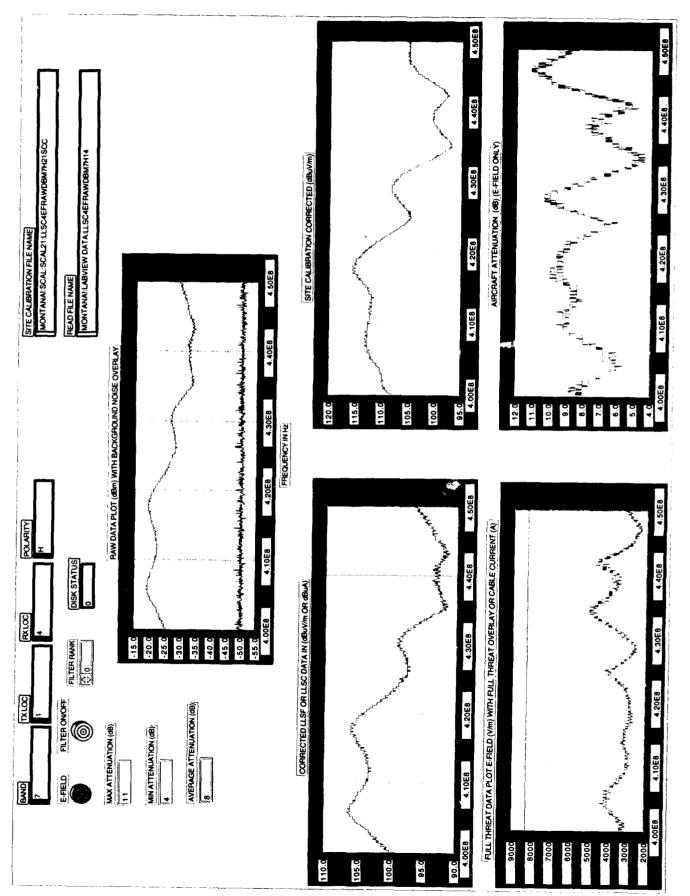


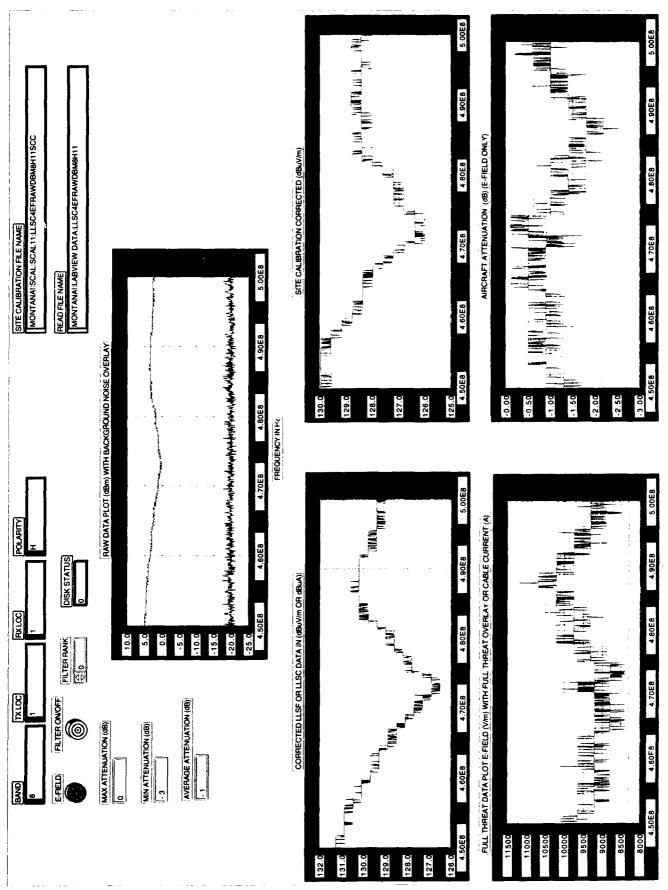


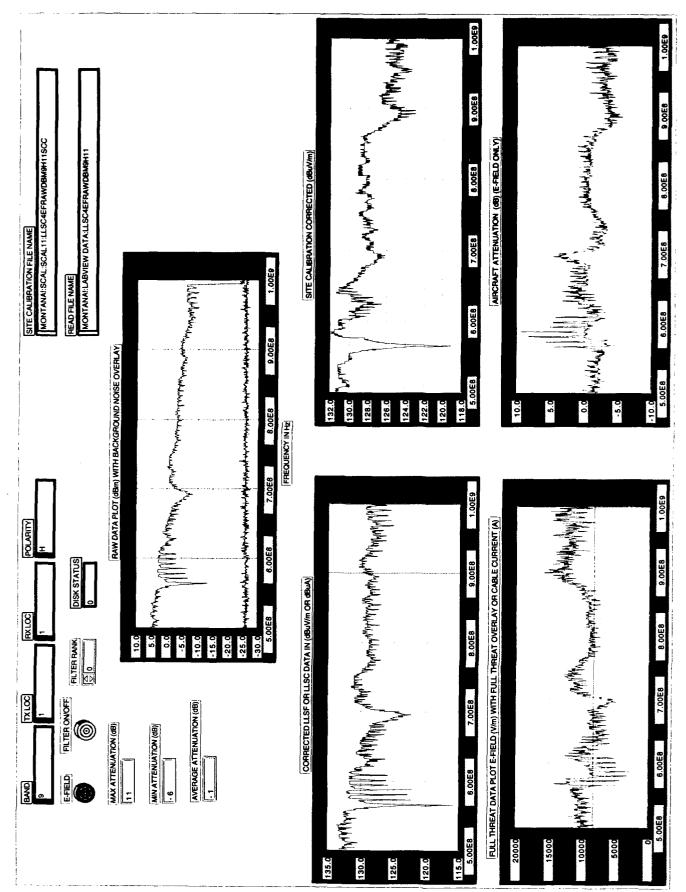


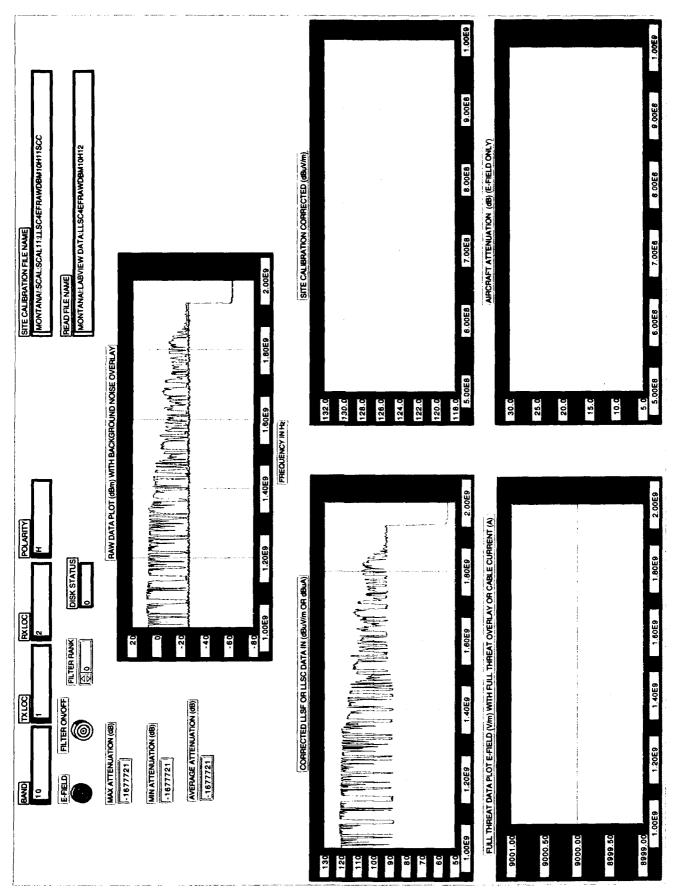


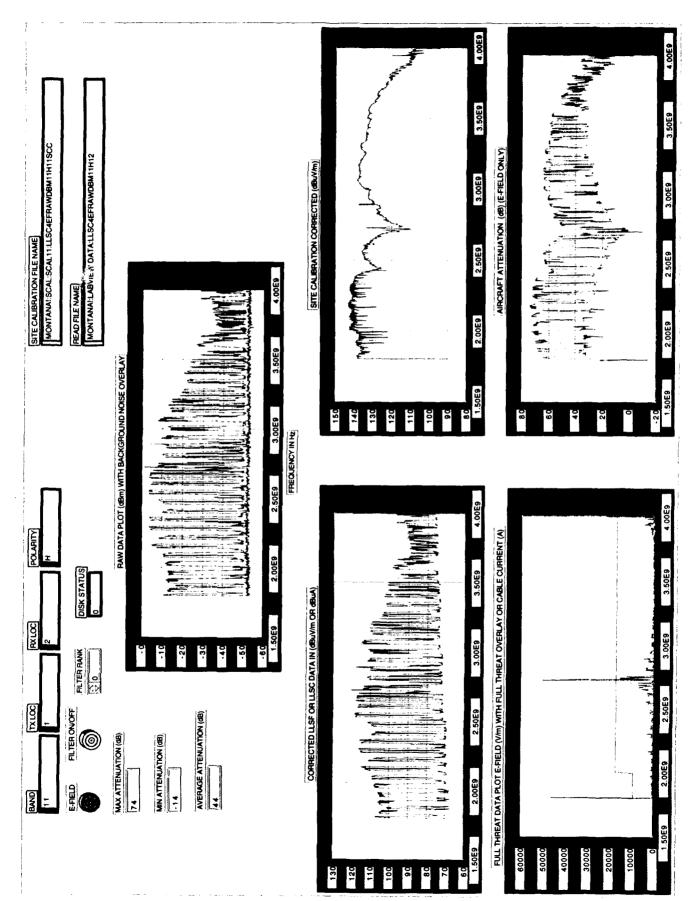


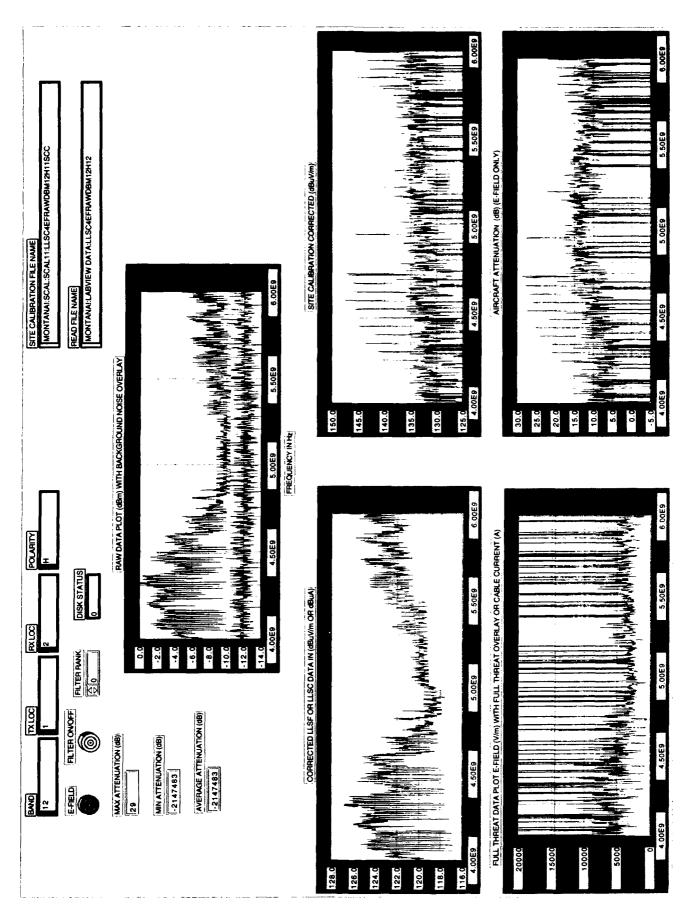


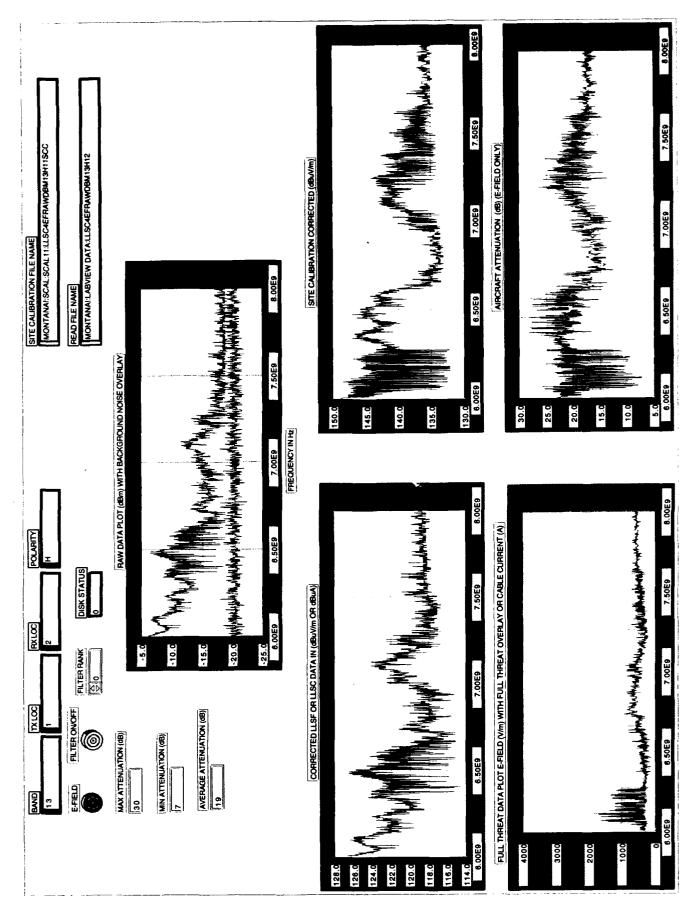


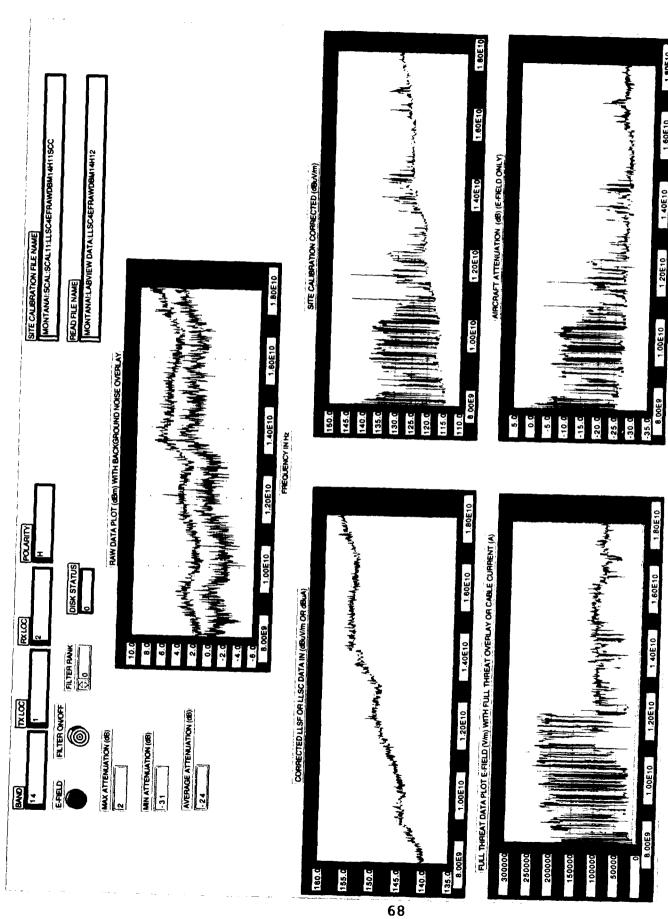


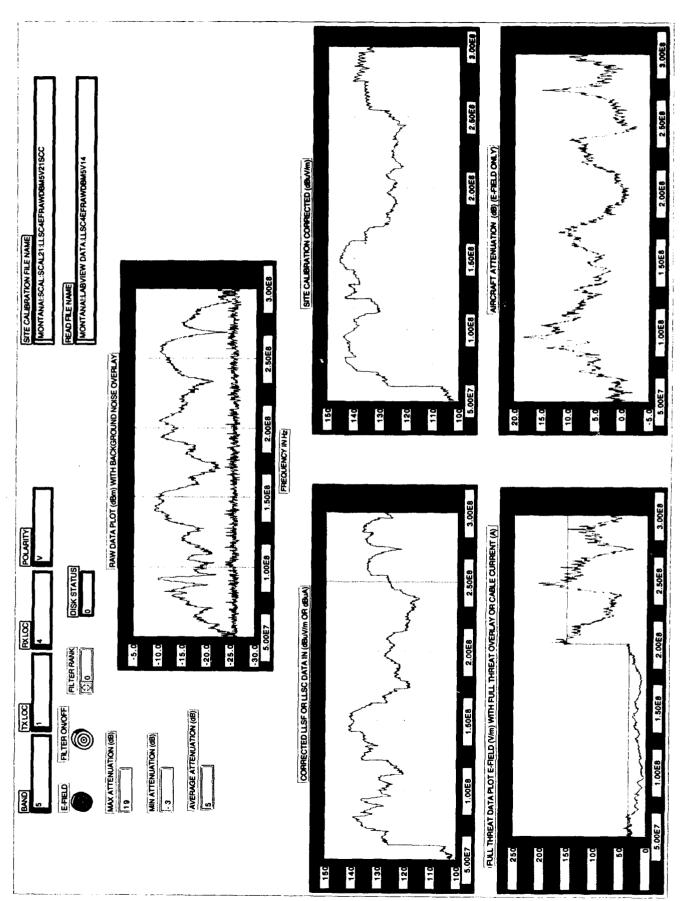


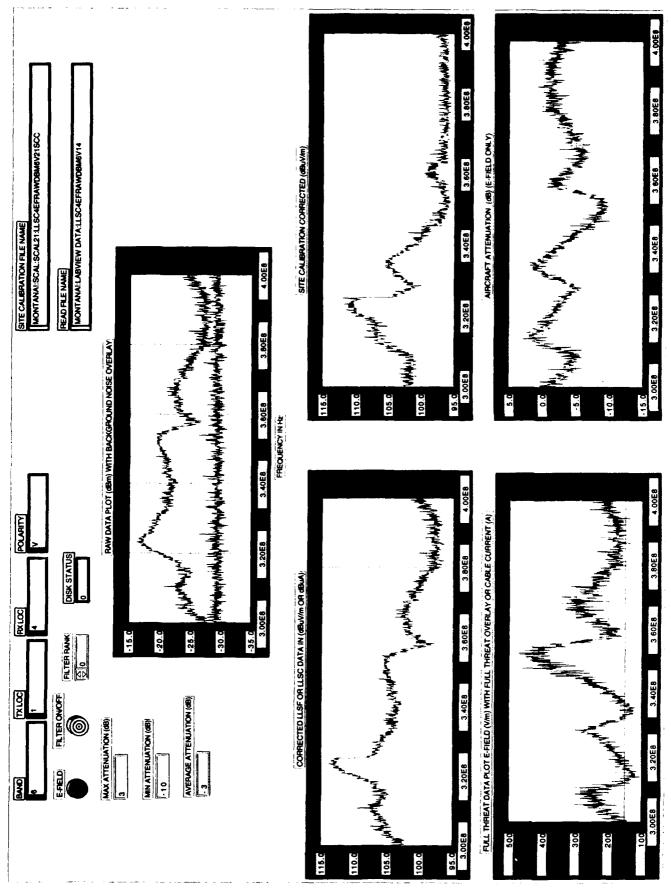


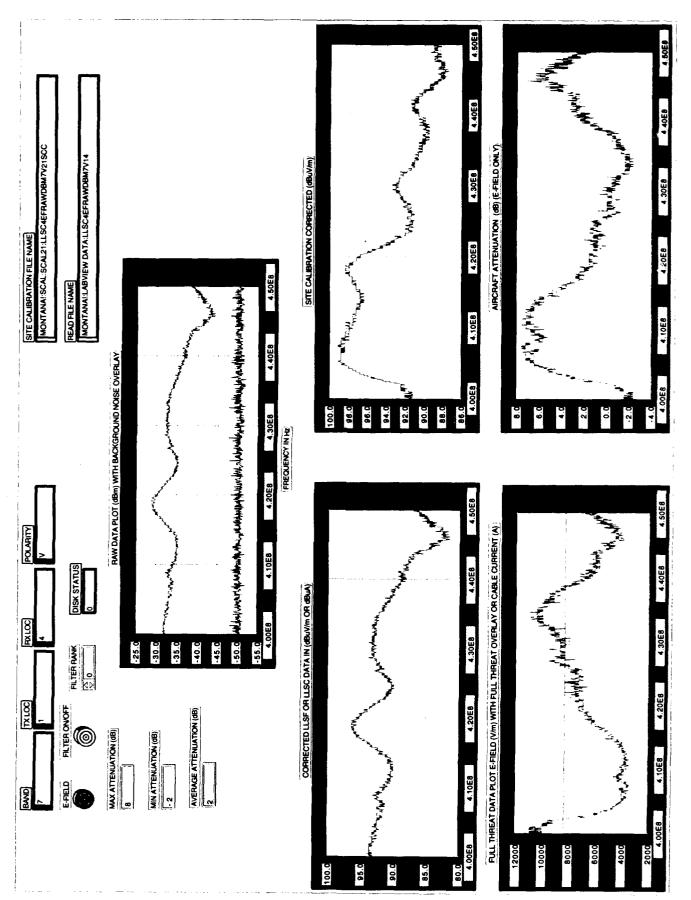


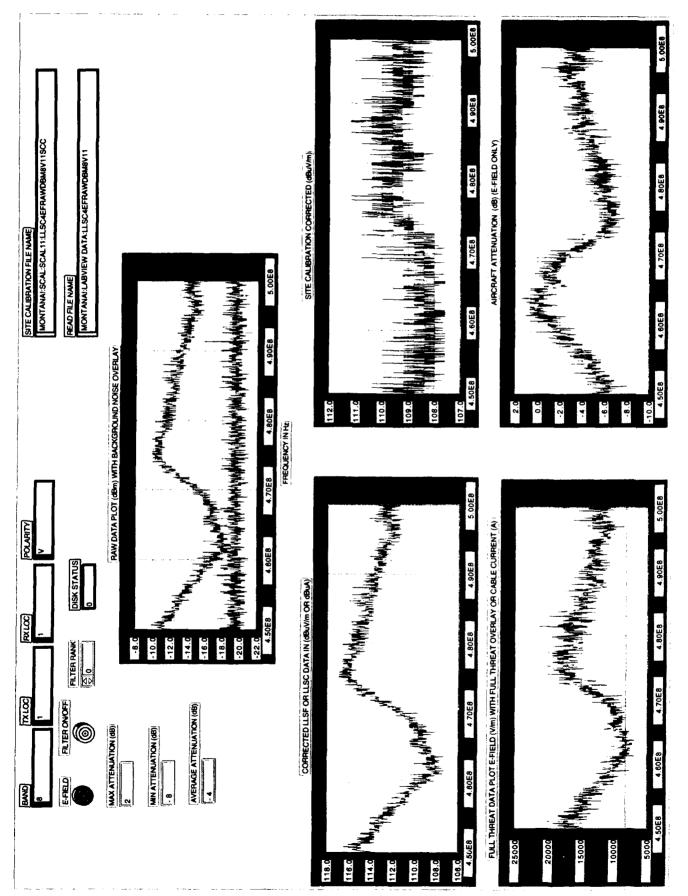


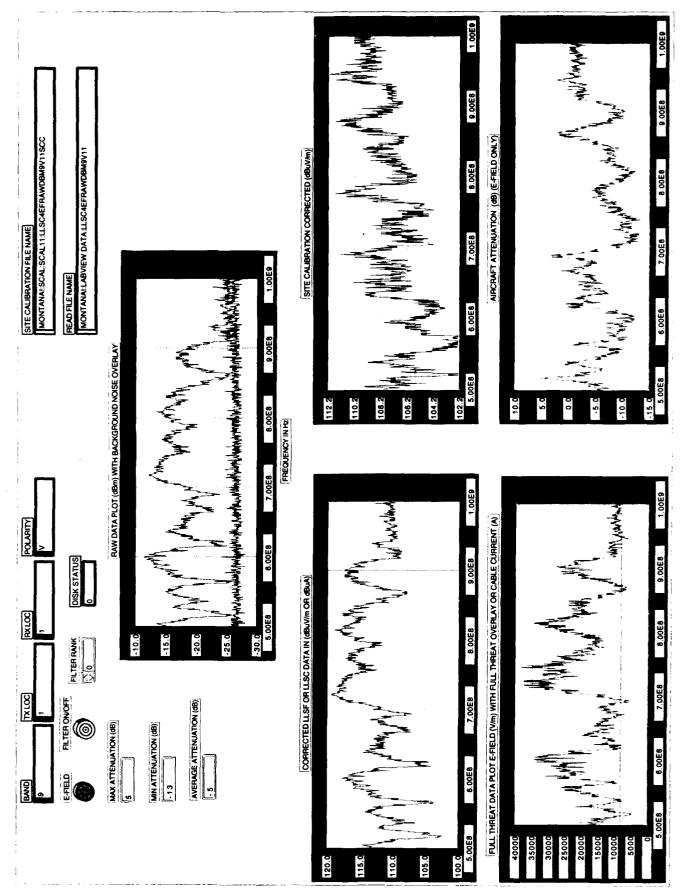


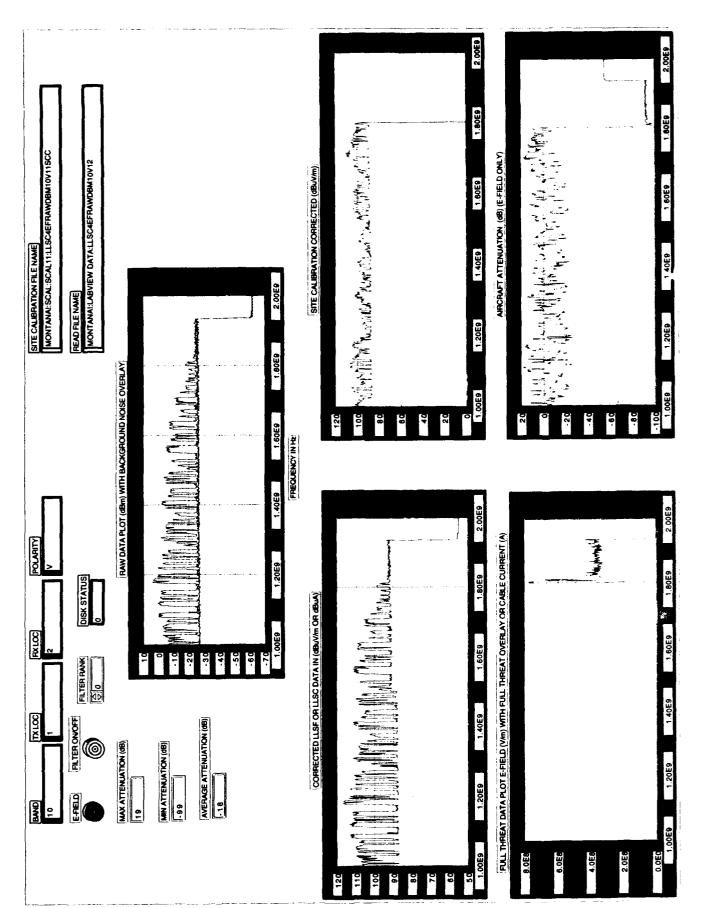


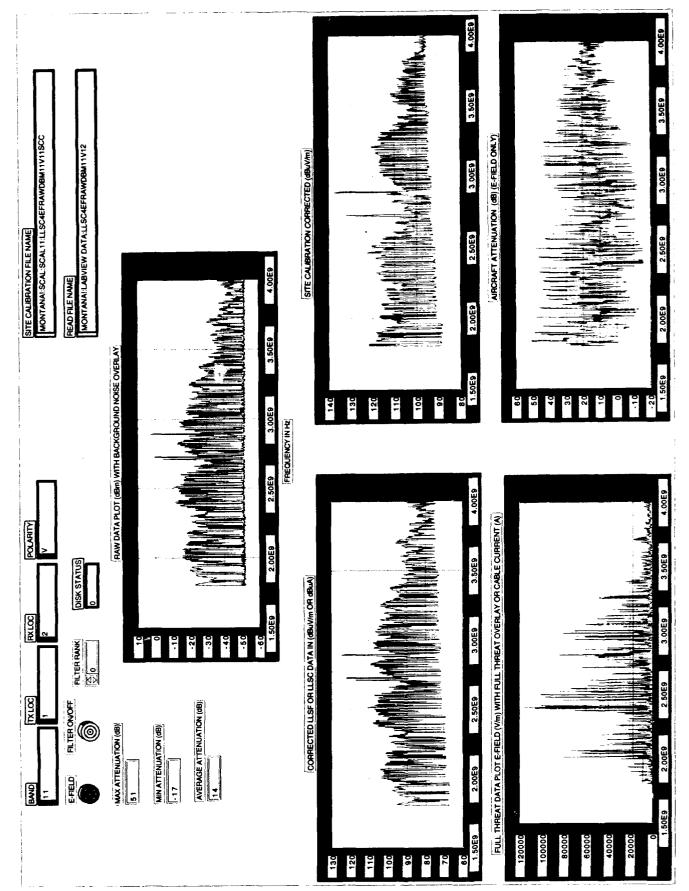


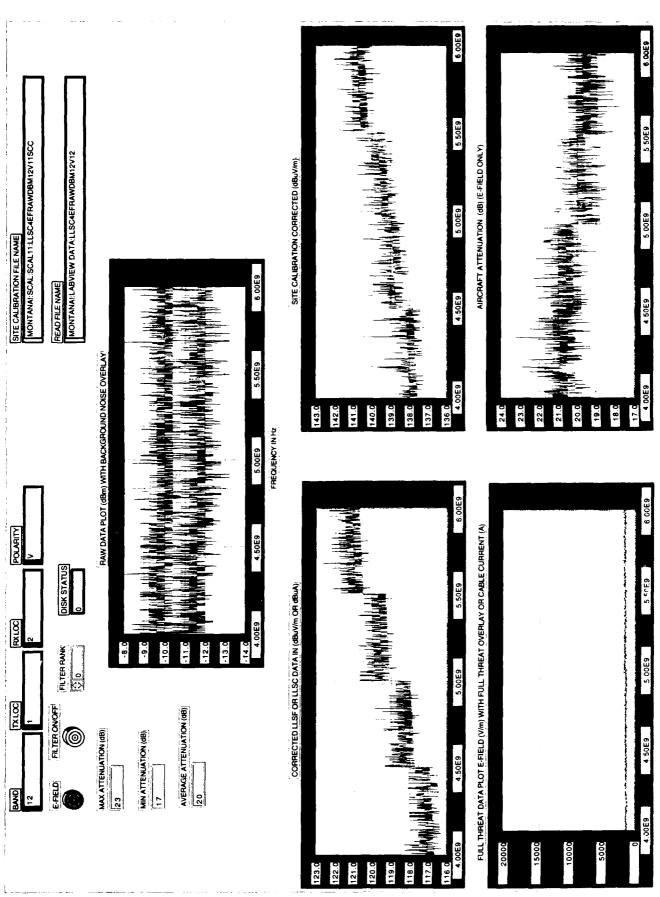


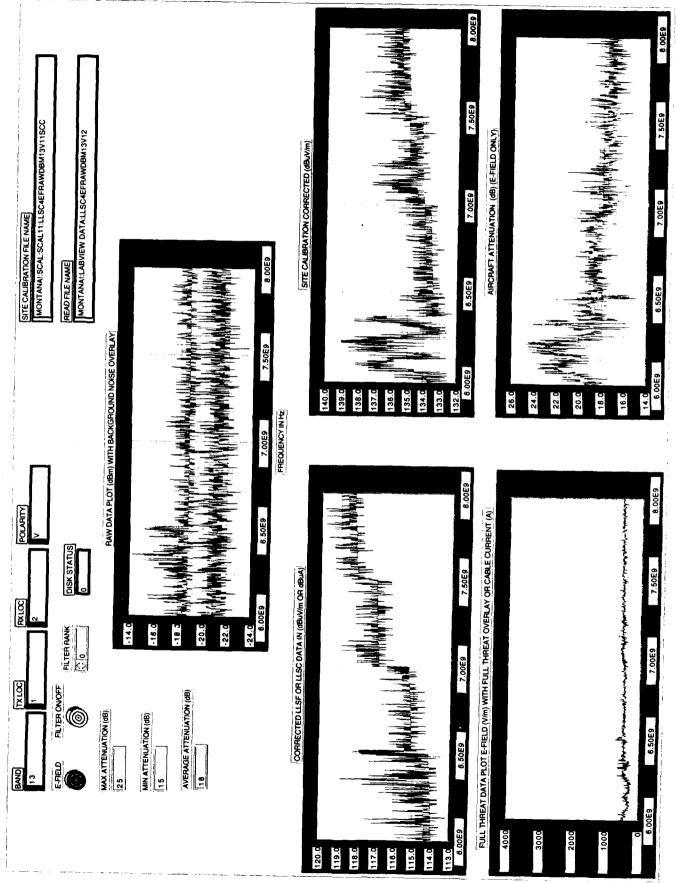


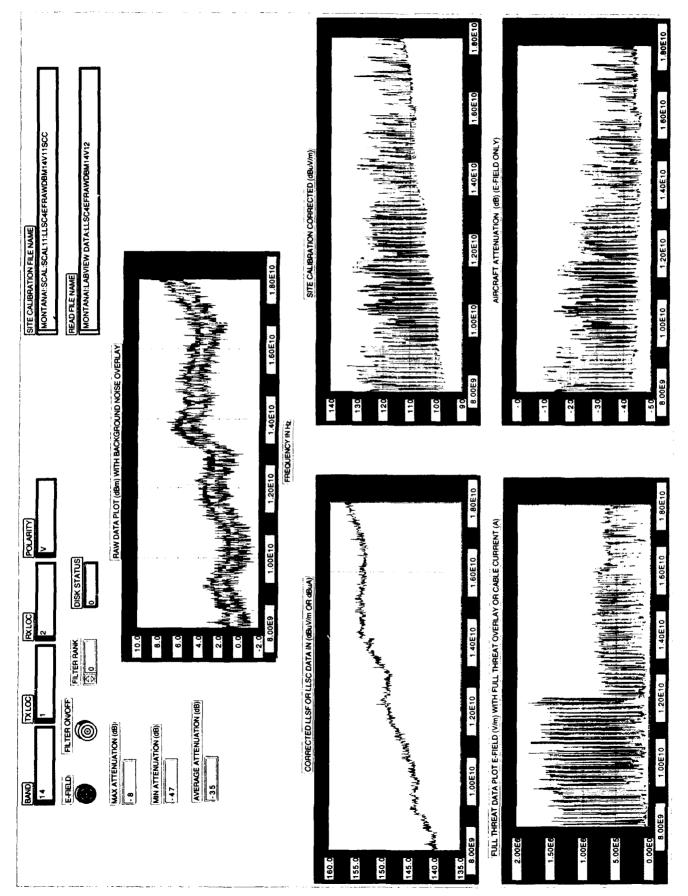


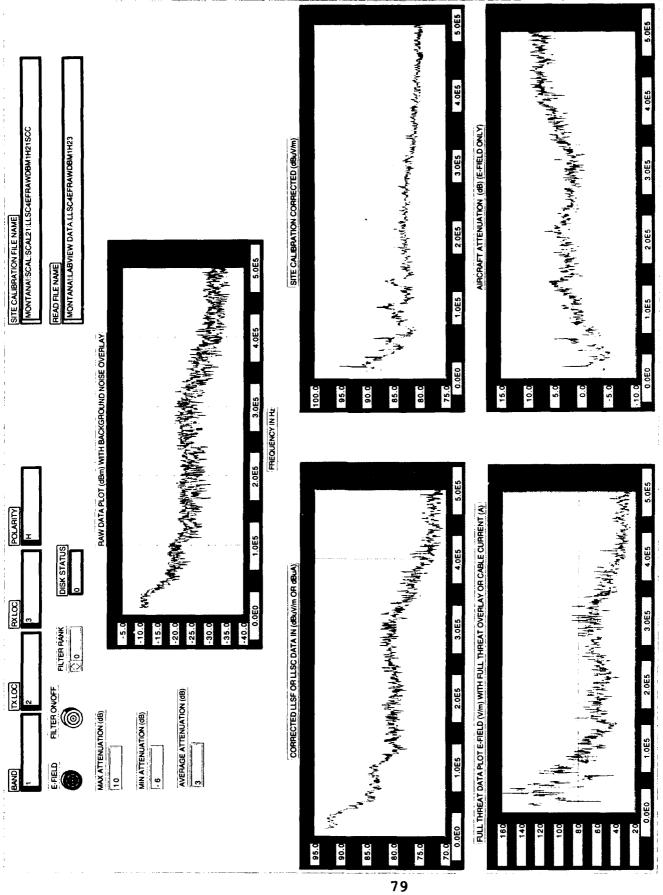


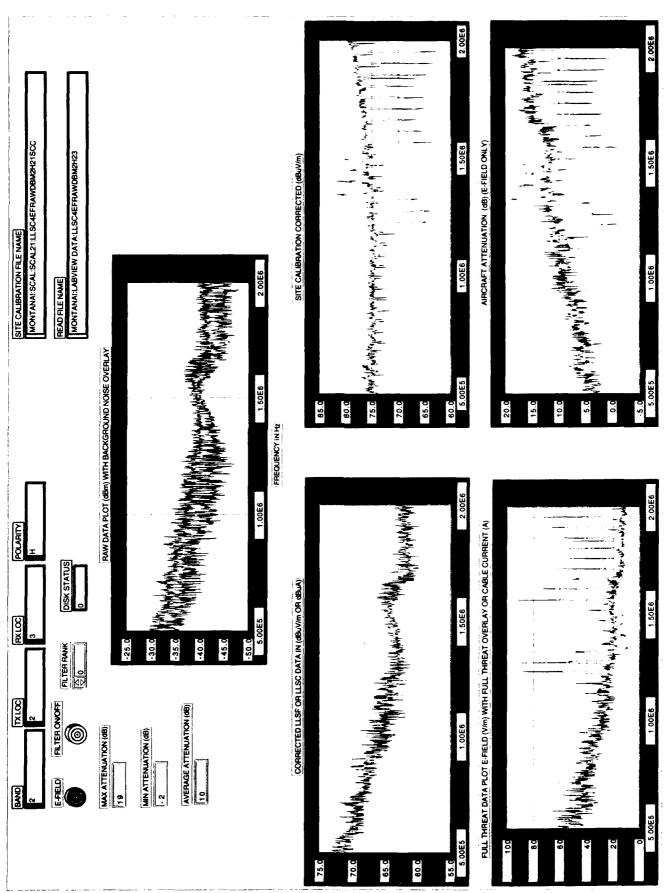


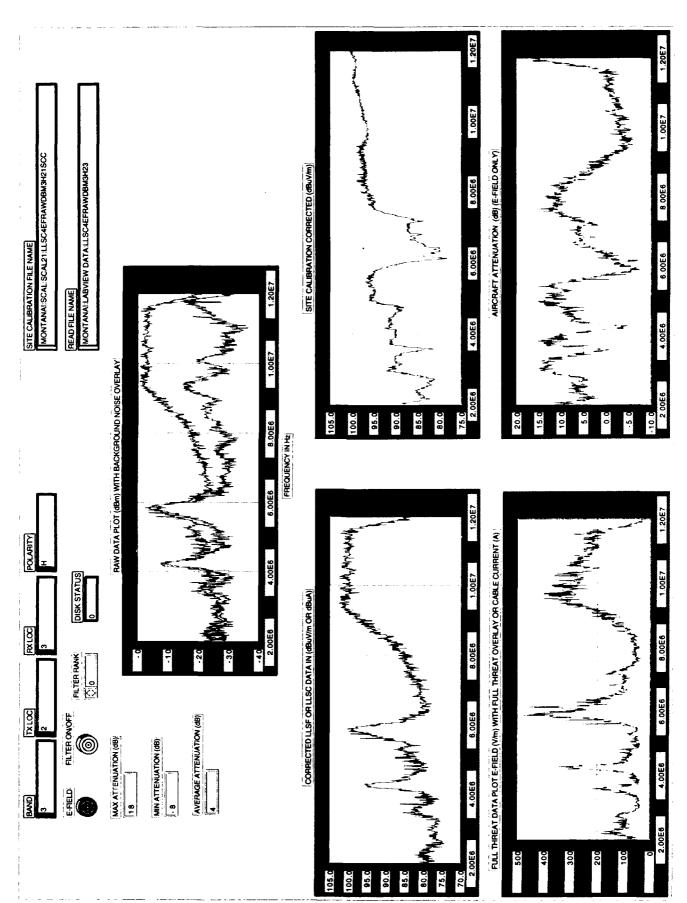


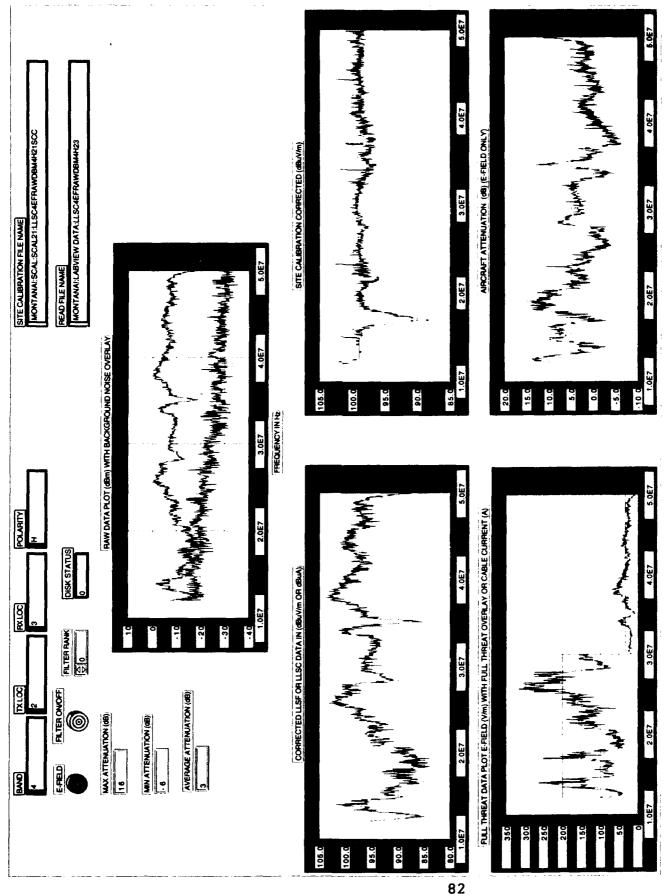


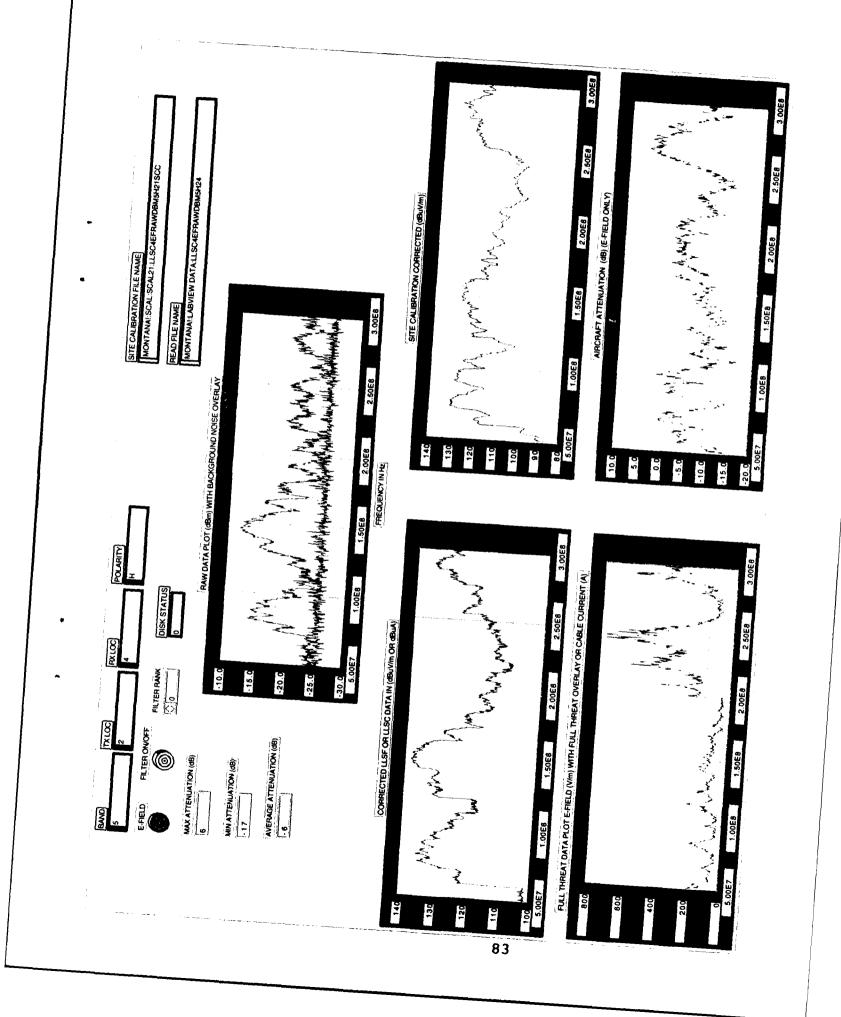


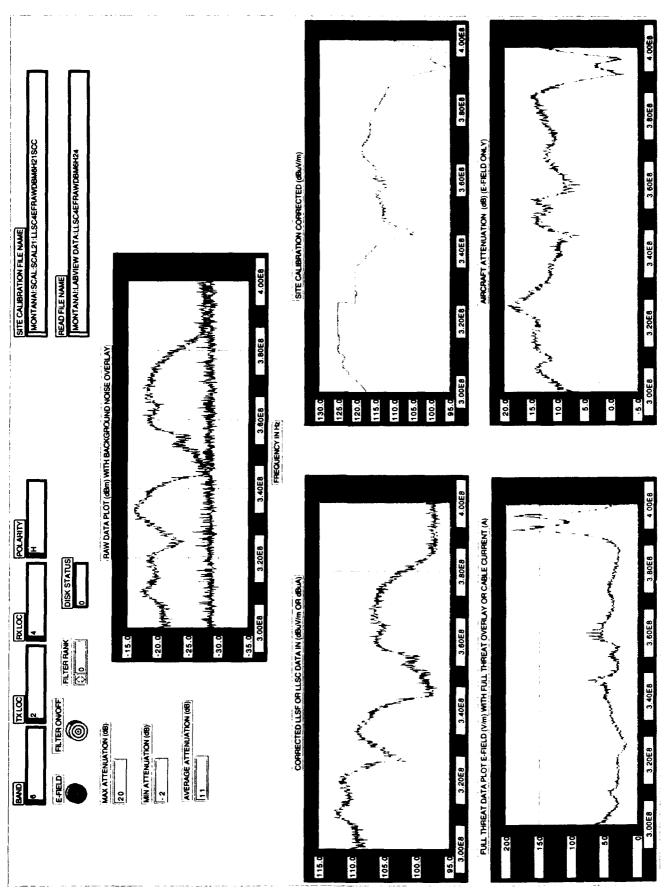


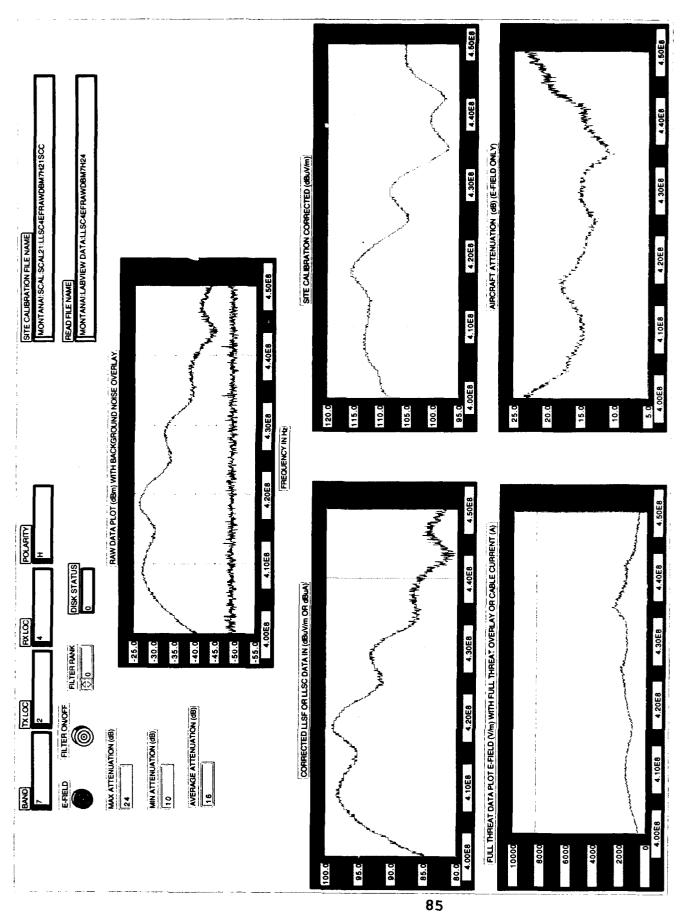


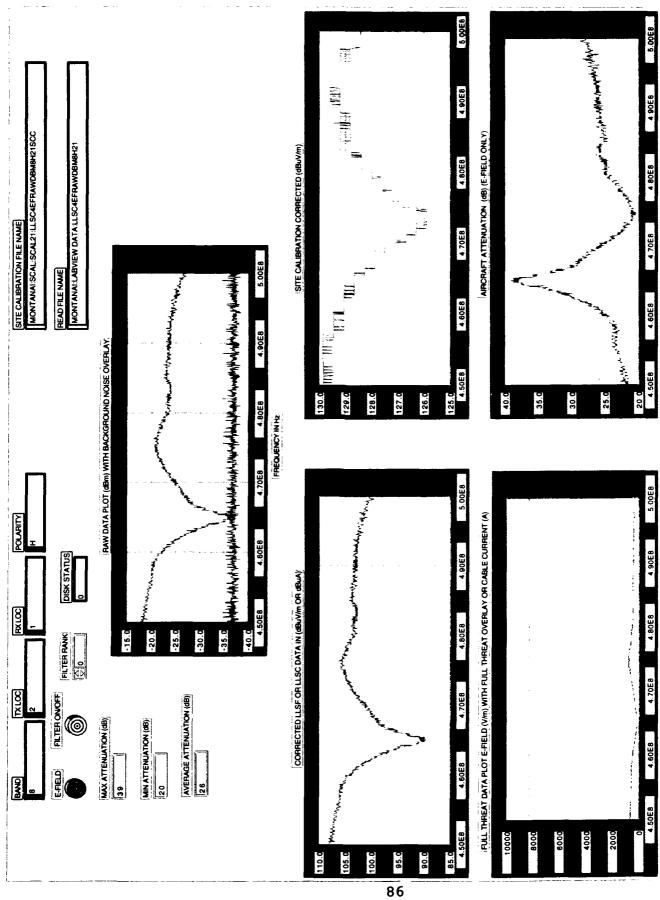


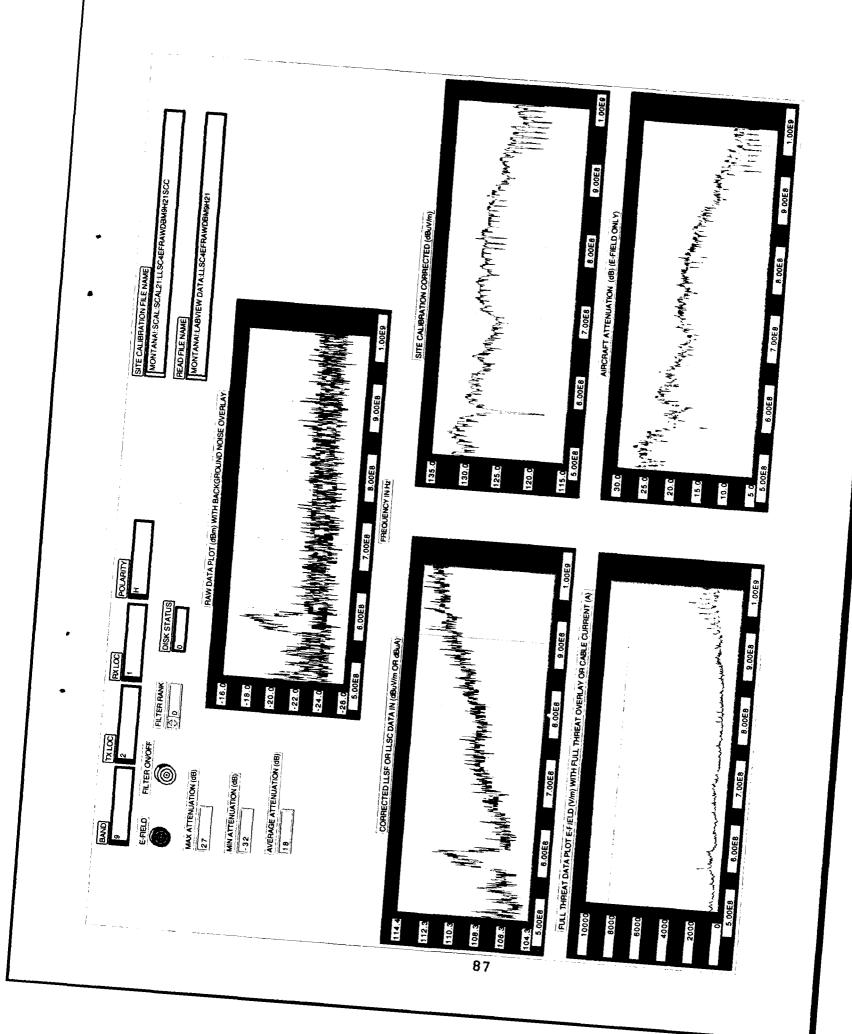


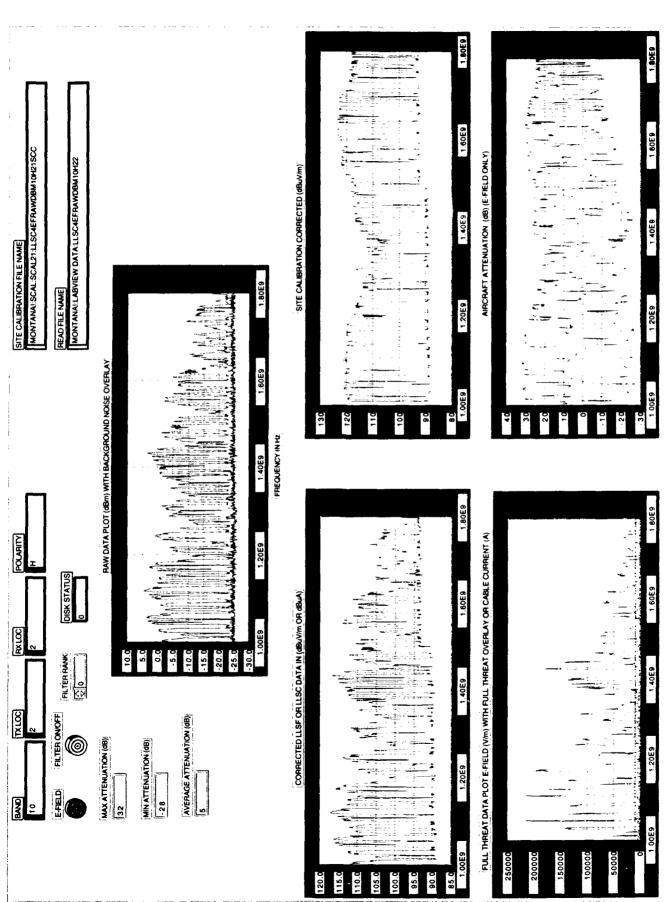


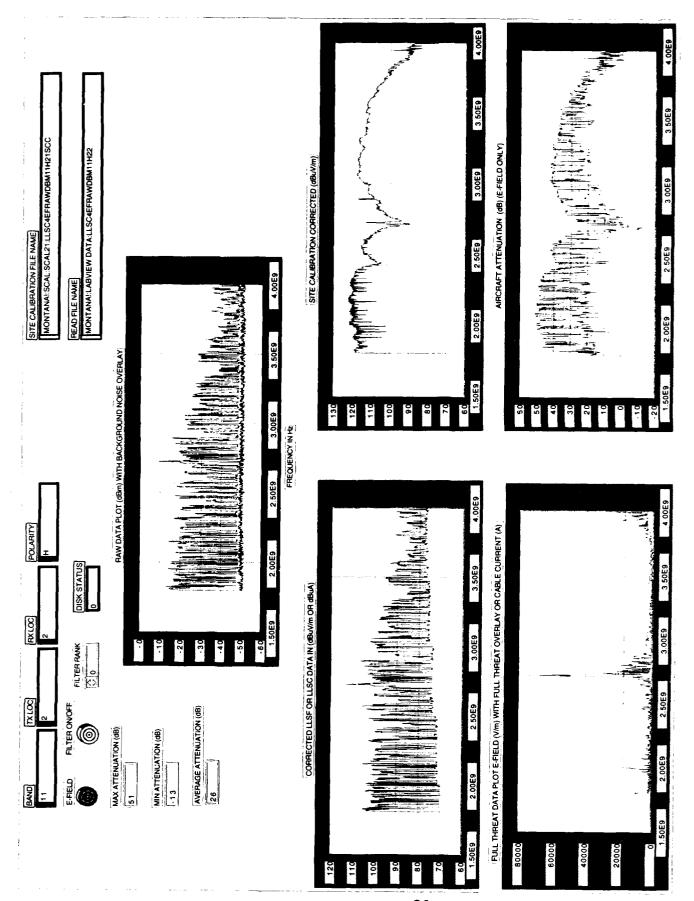


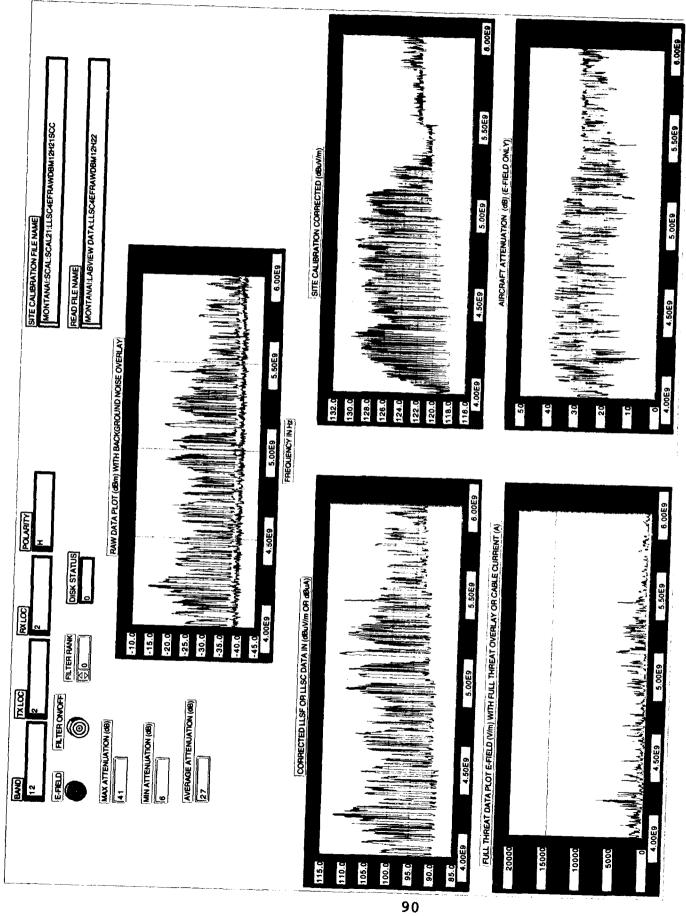


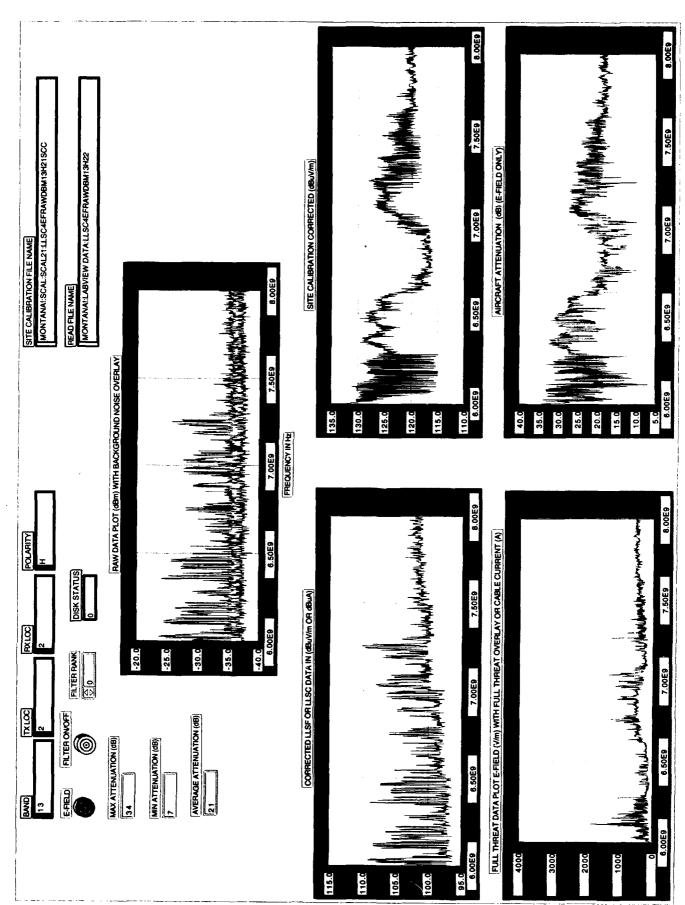


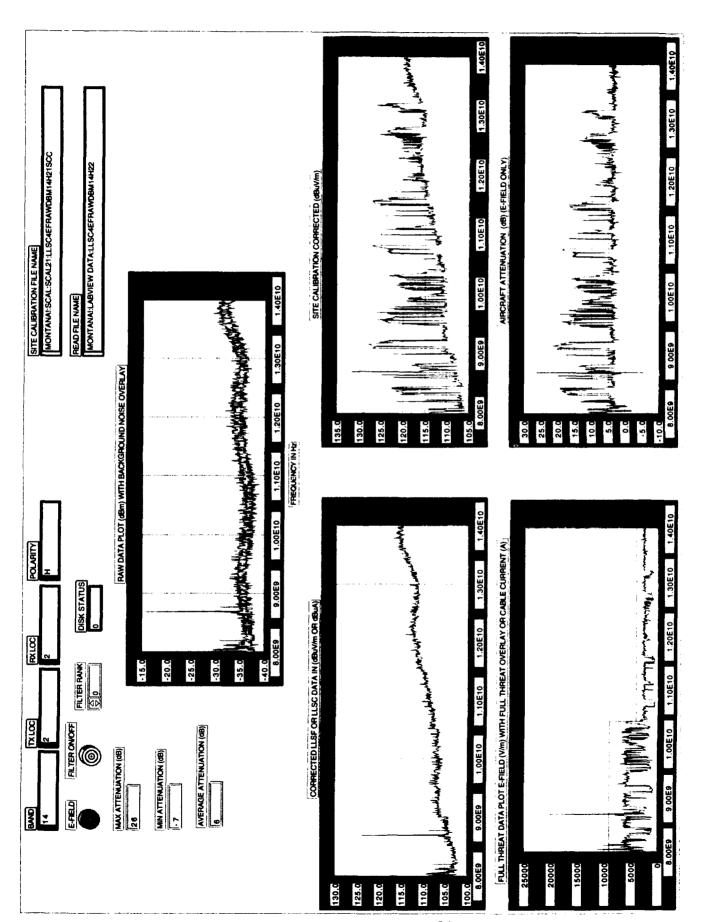


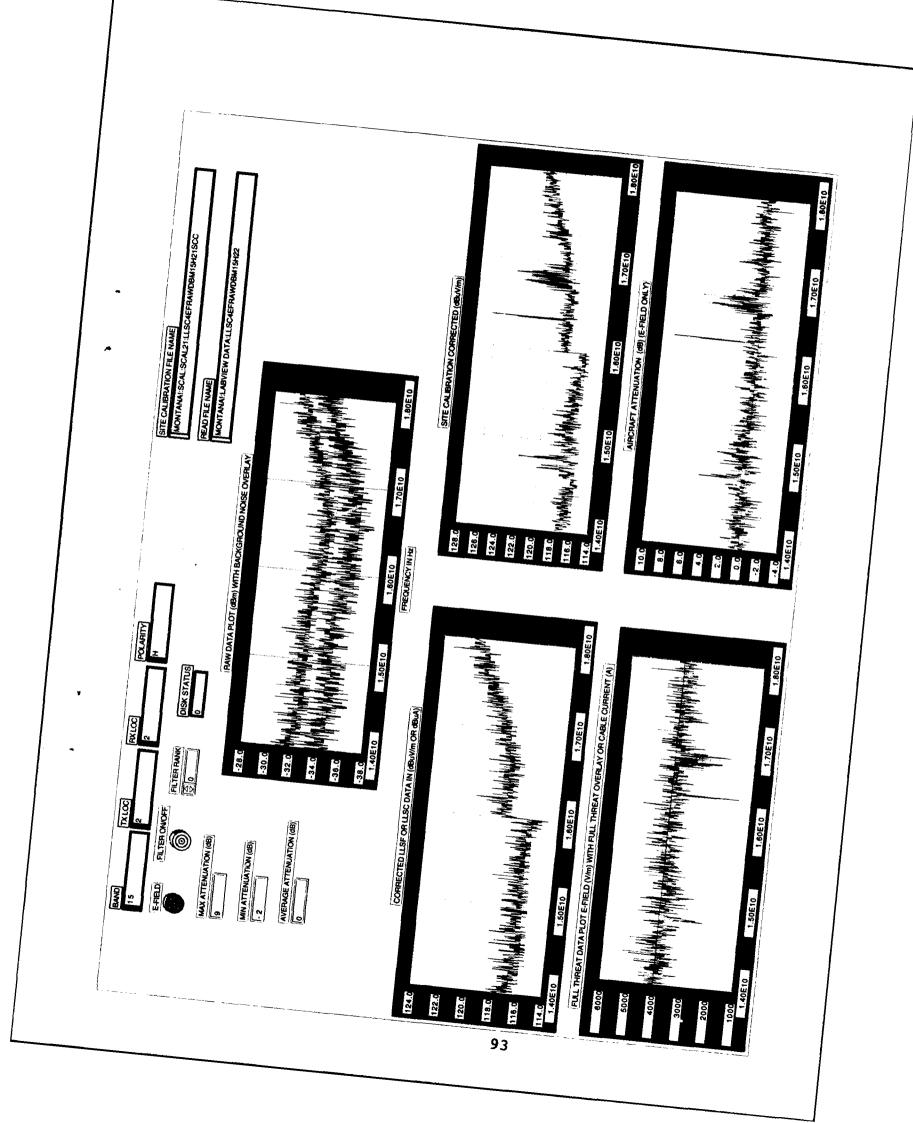


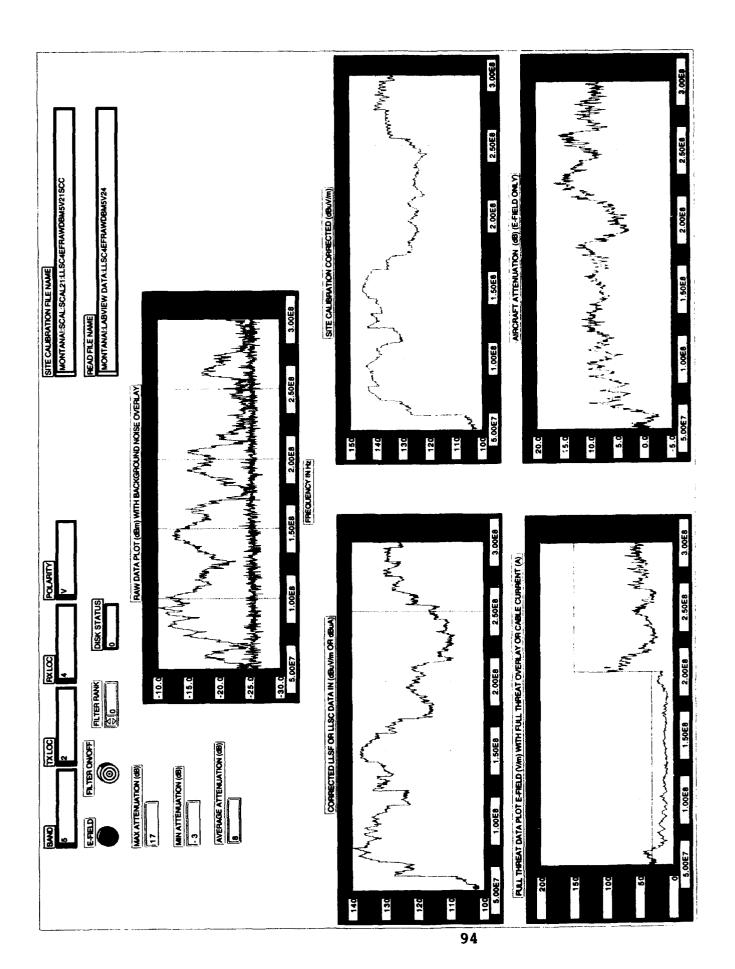


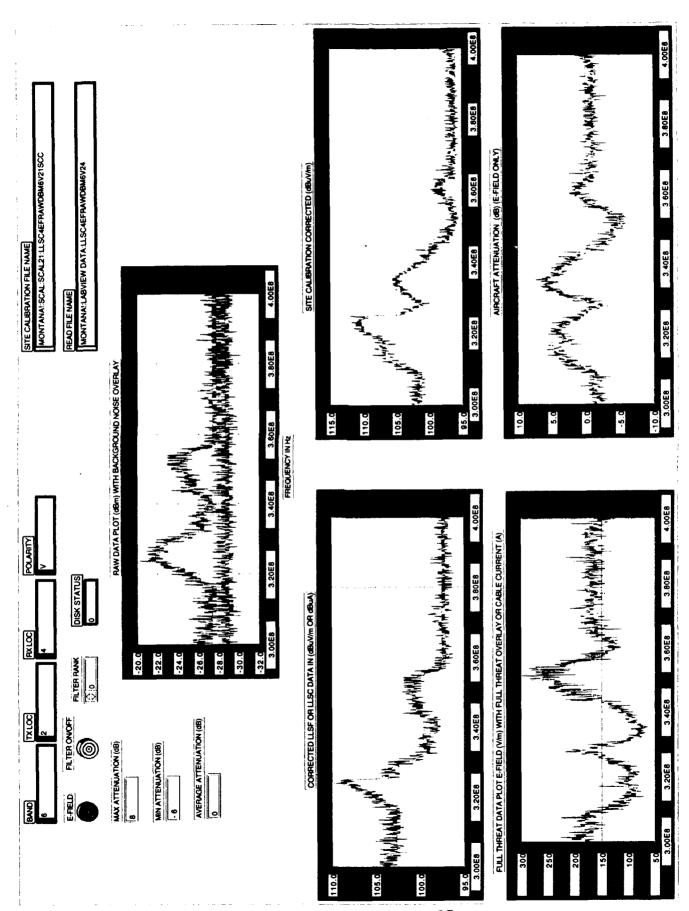


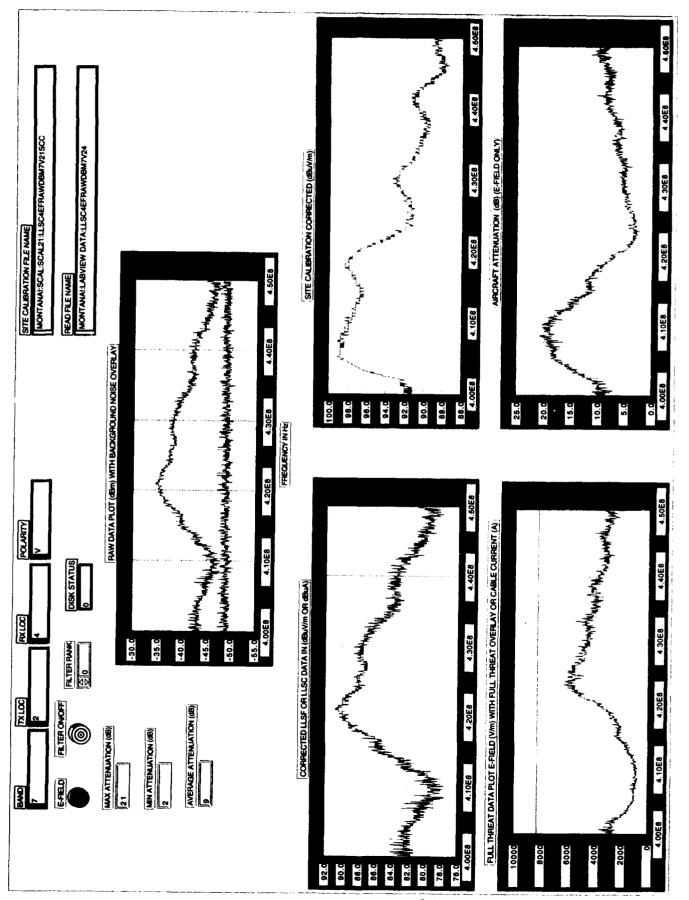


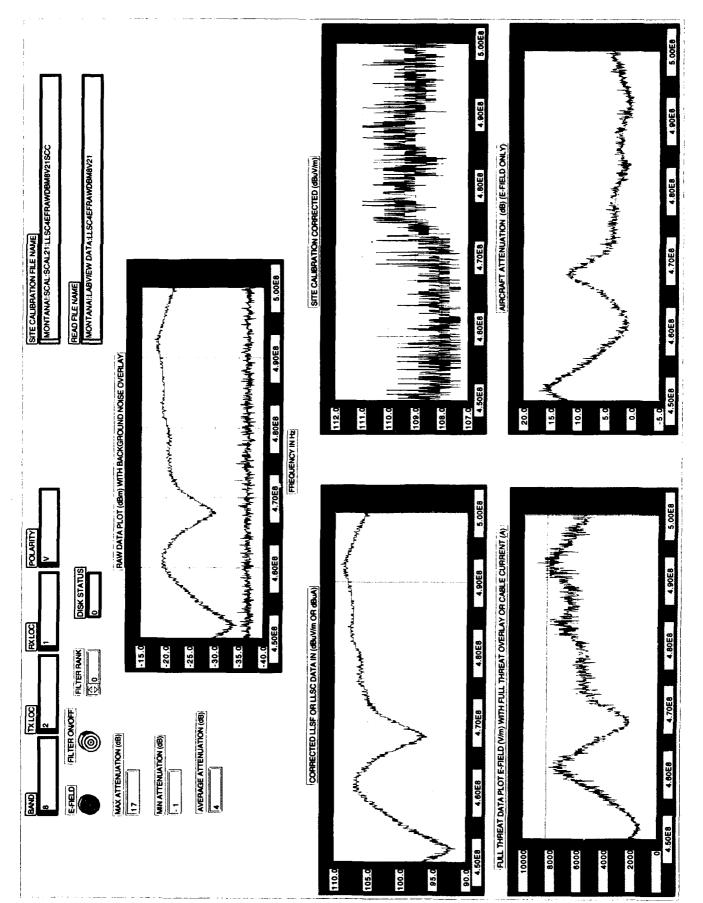


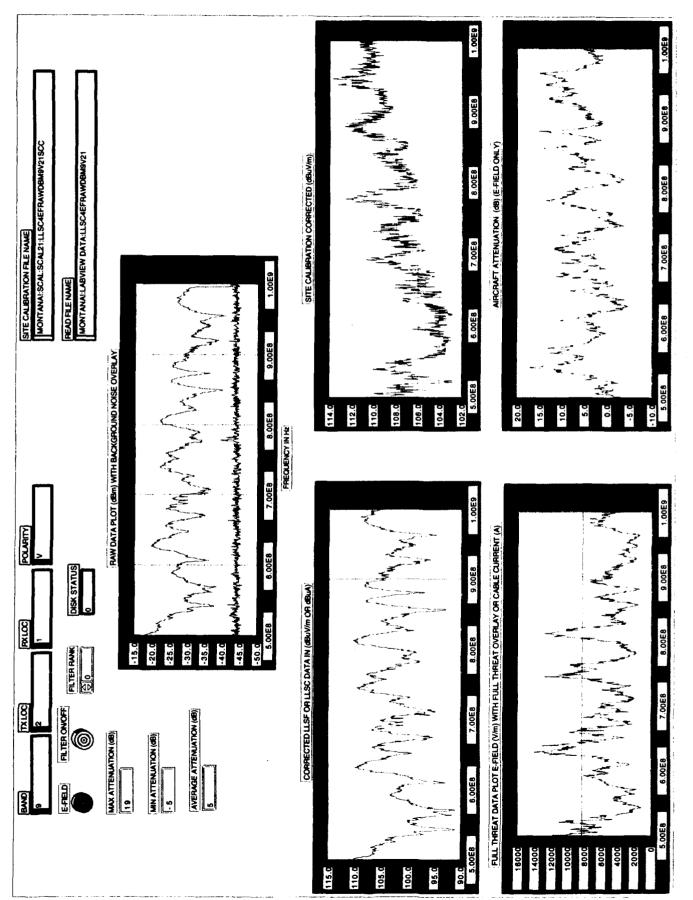


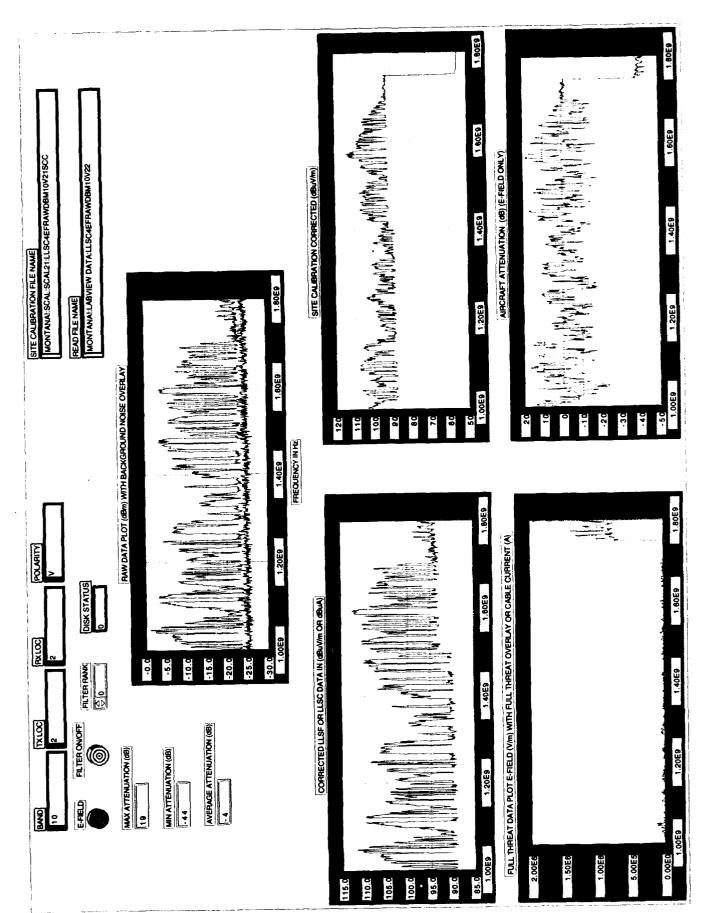


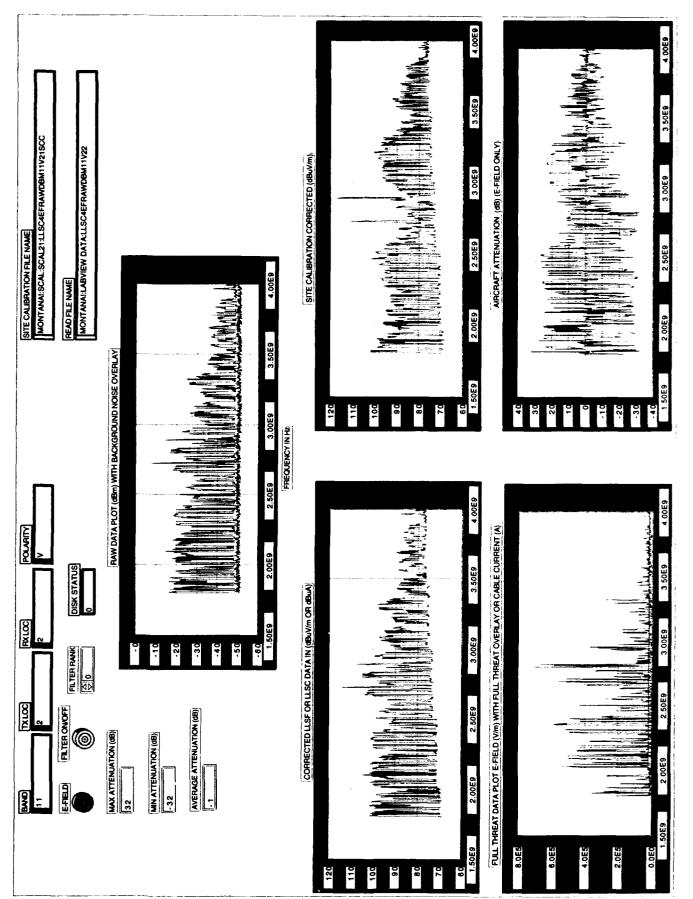


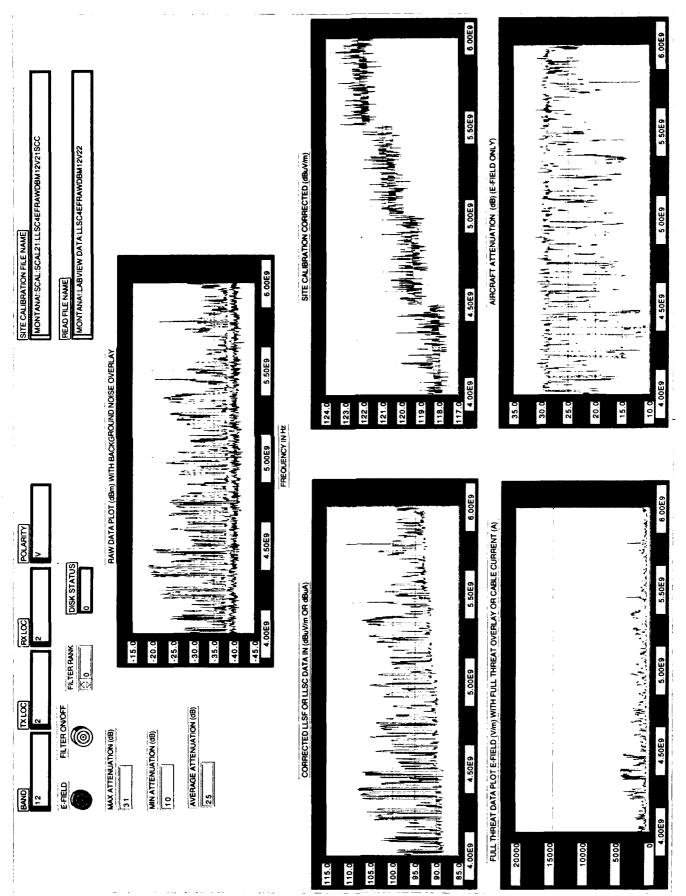


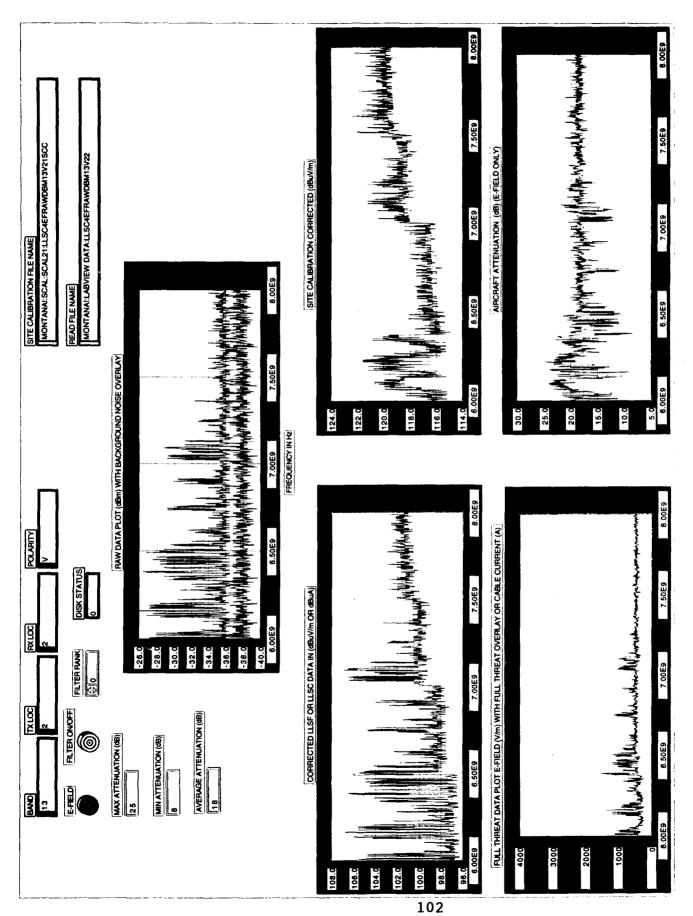


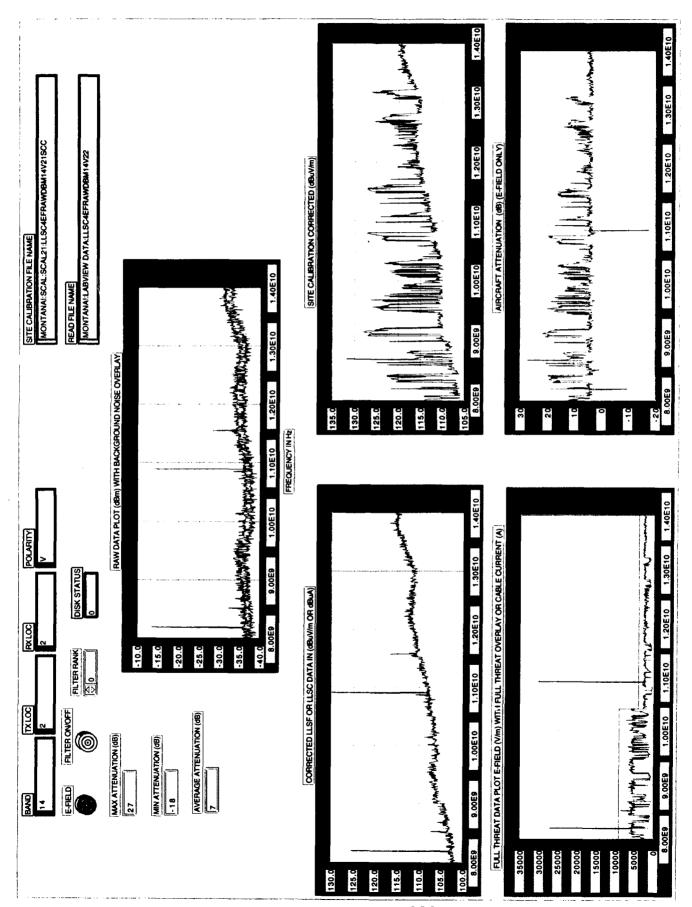


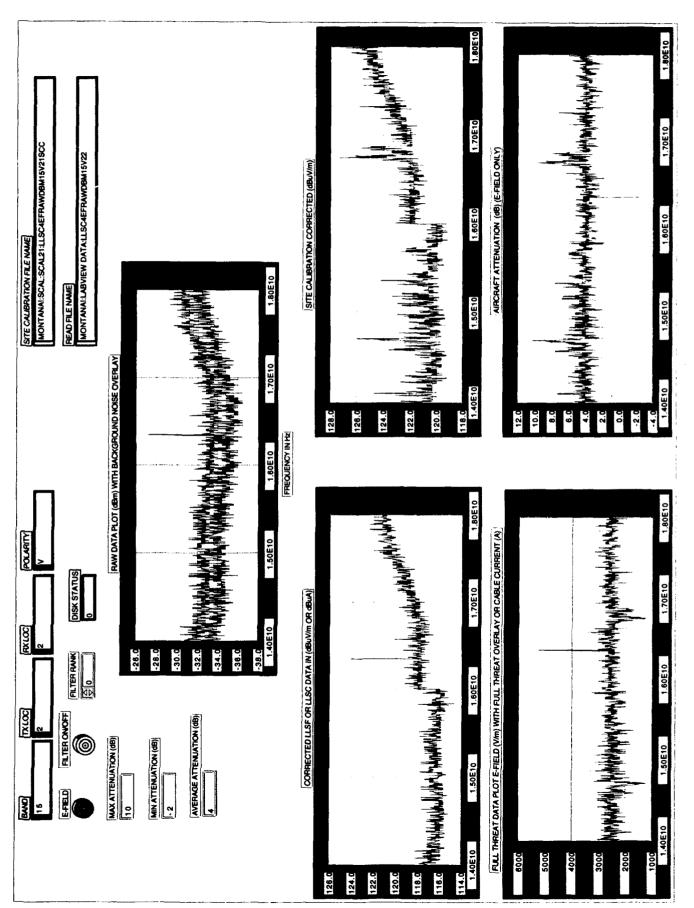




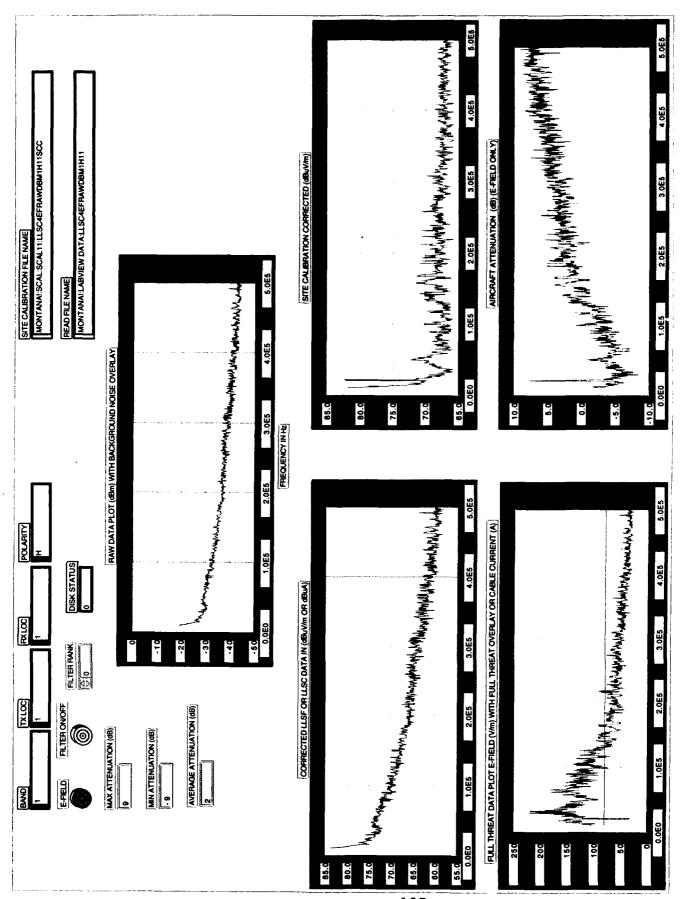


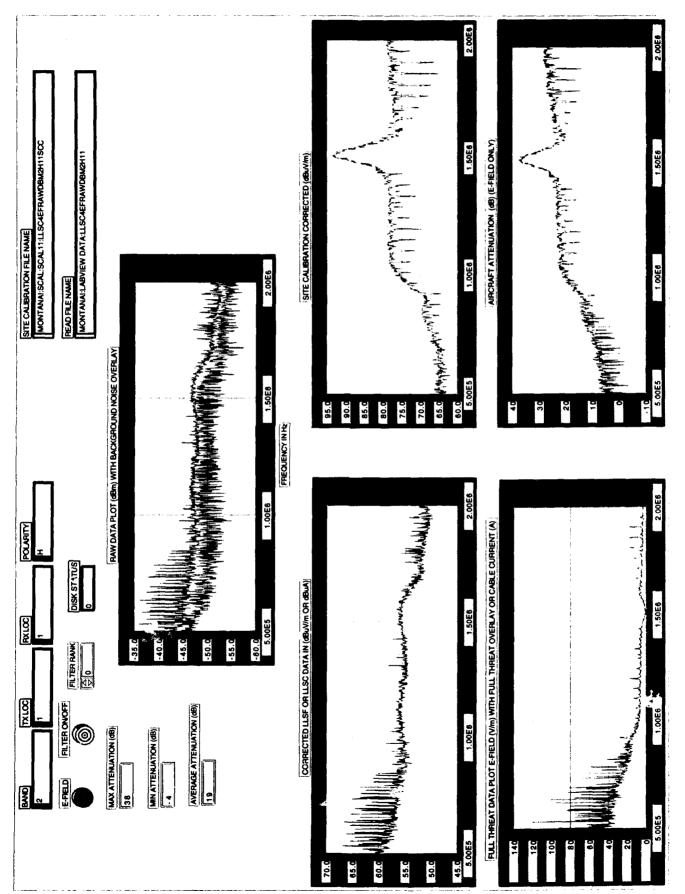


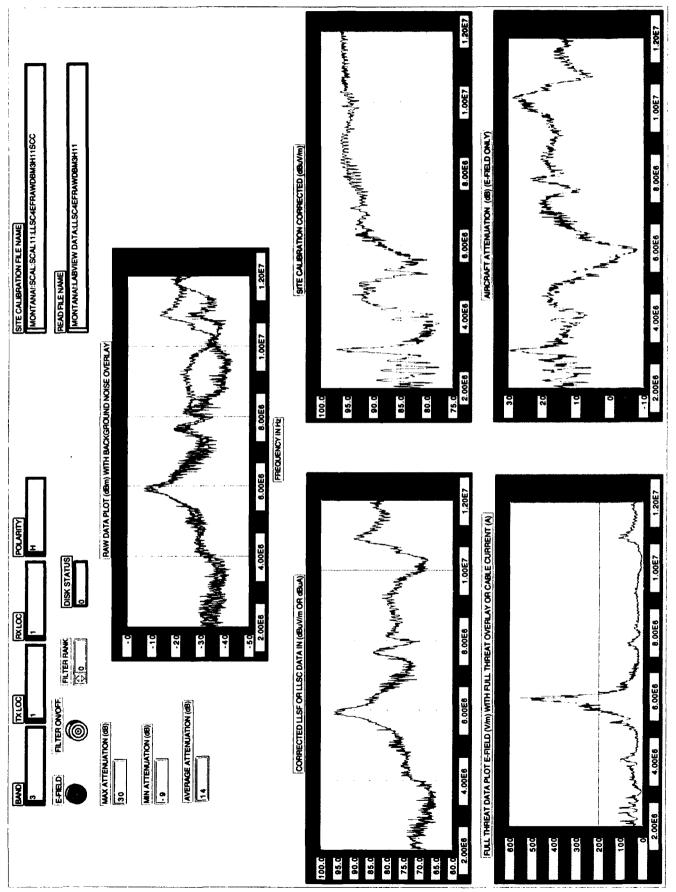


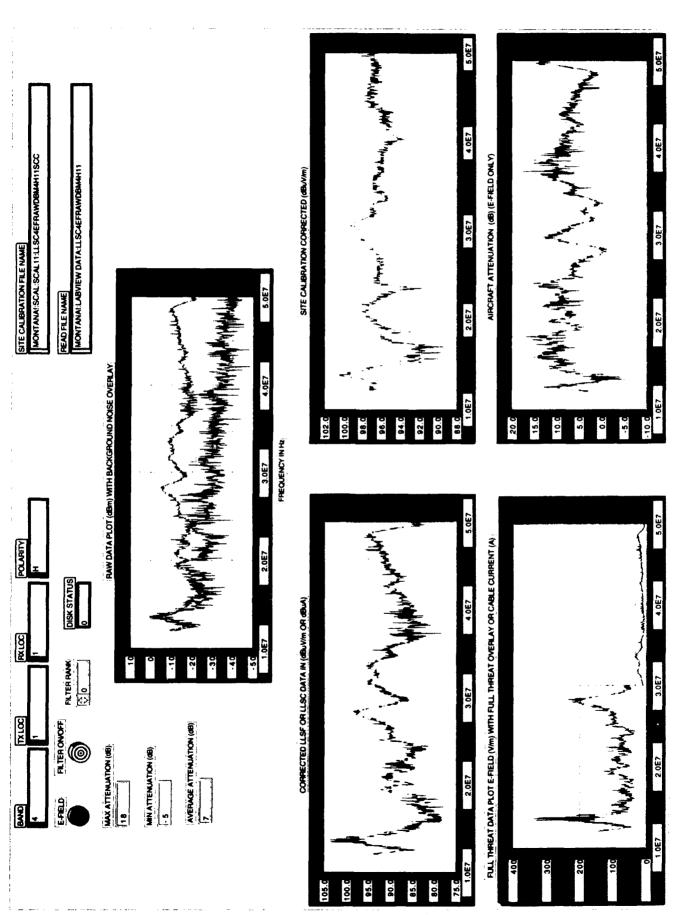


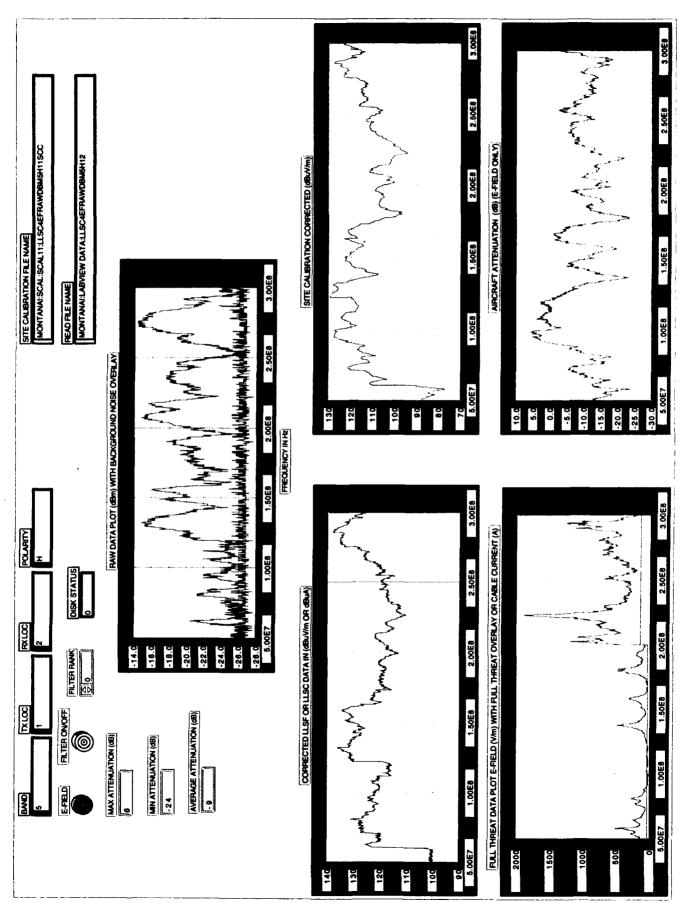
SECTION 1-3 CABIN AREA LLSF DATA PLOTS

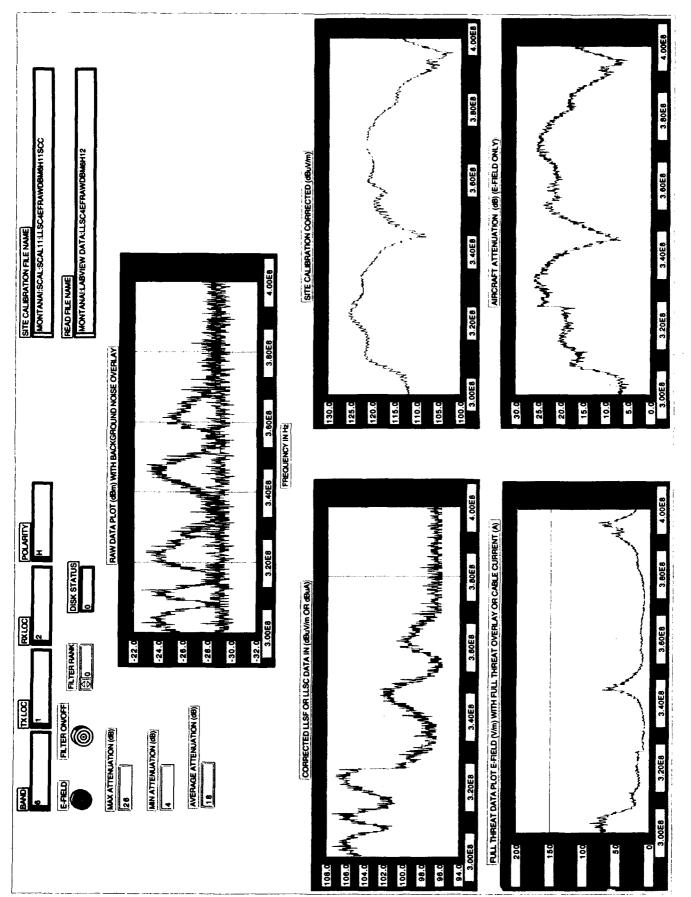


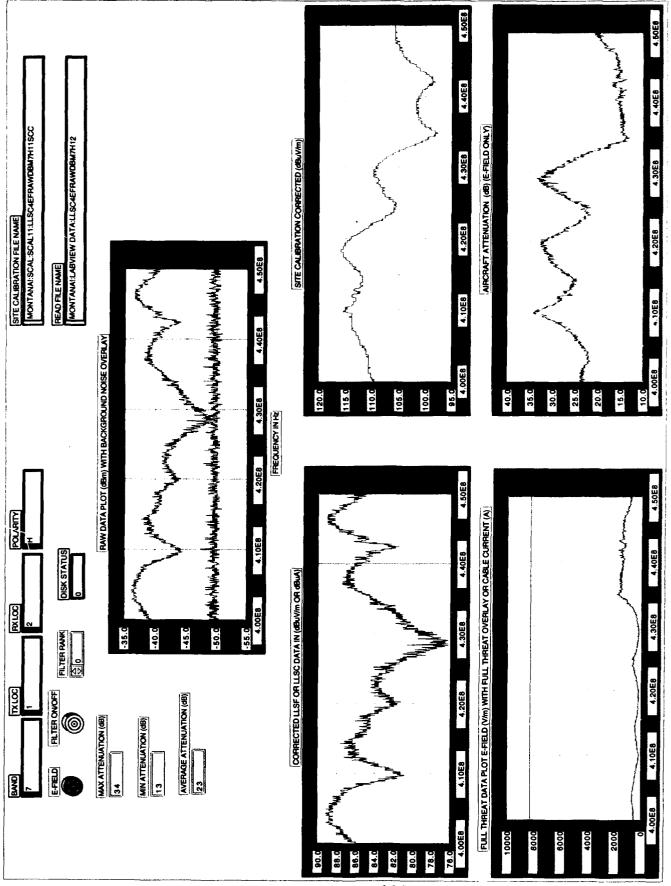


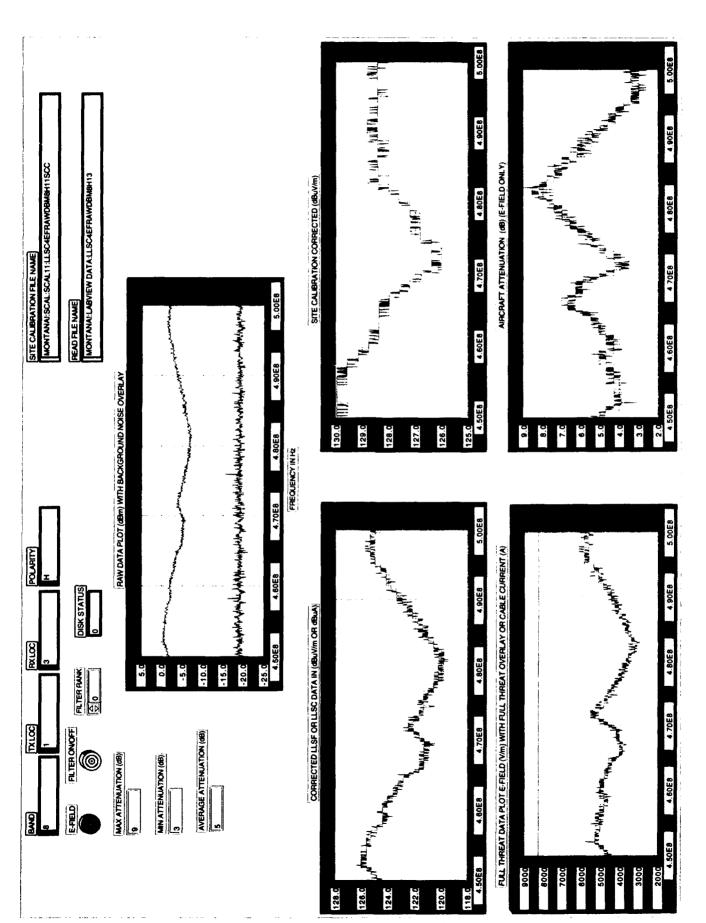


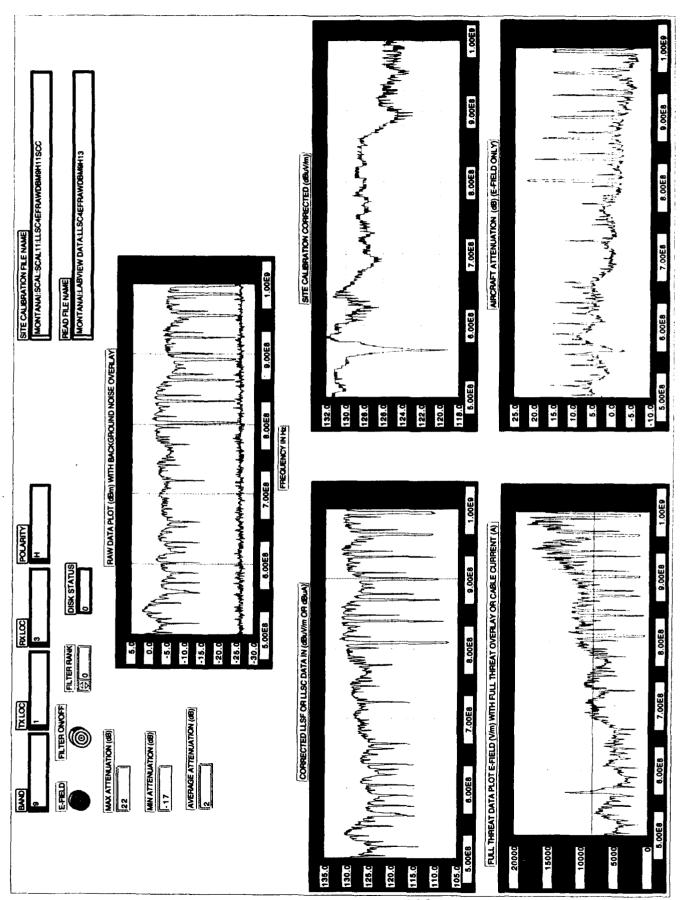


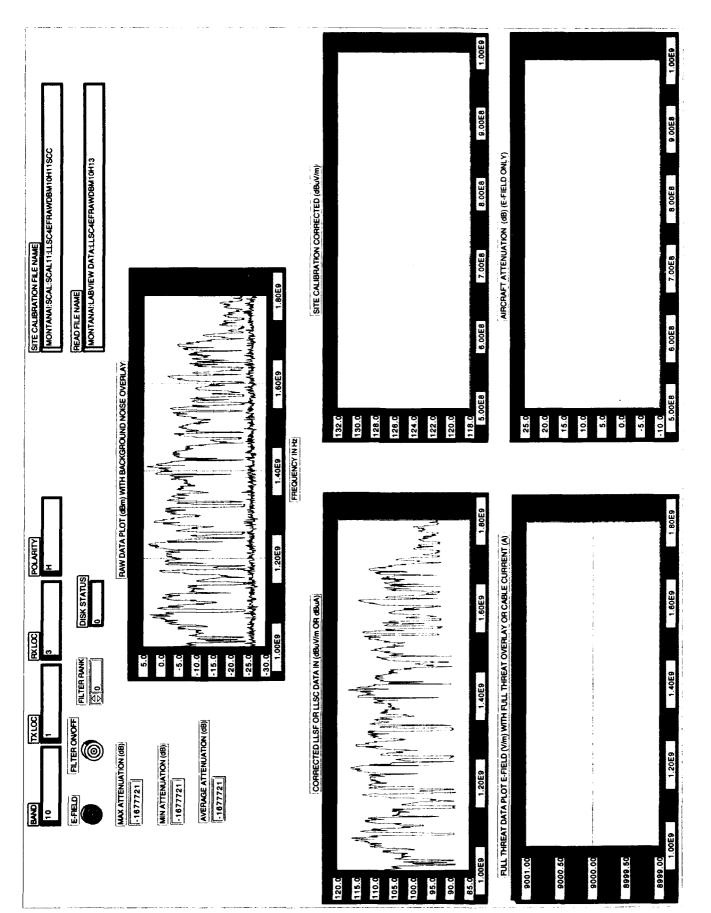


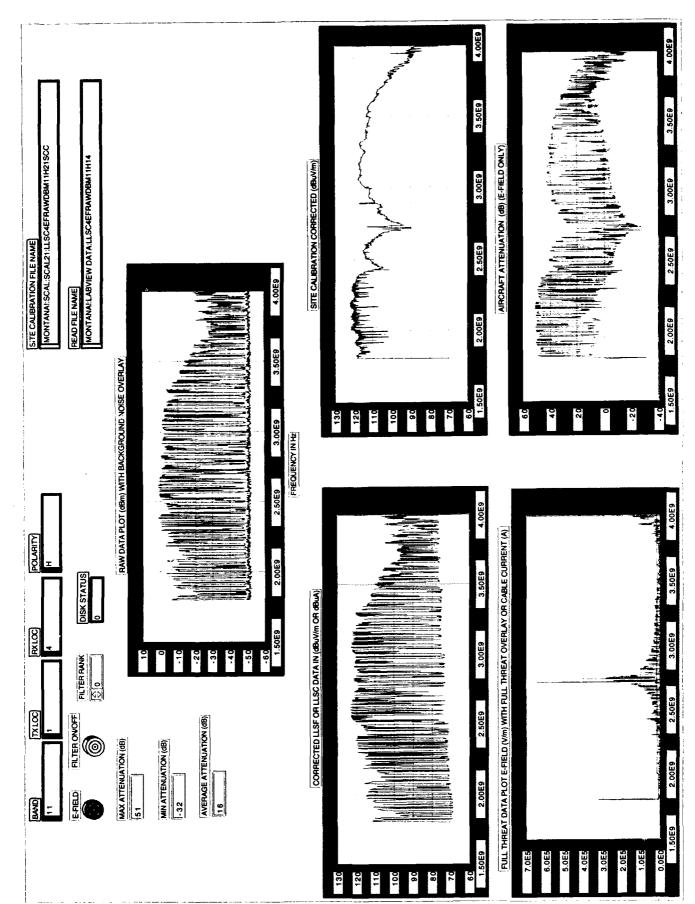


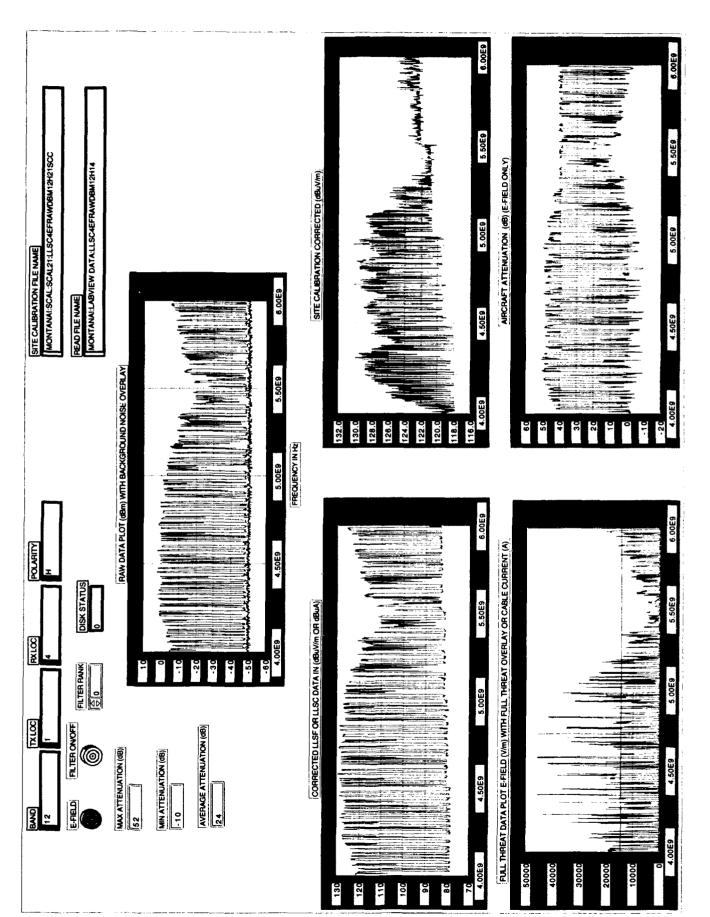


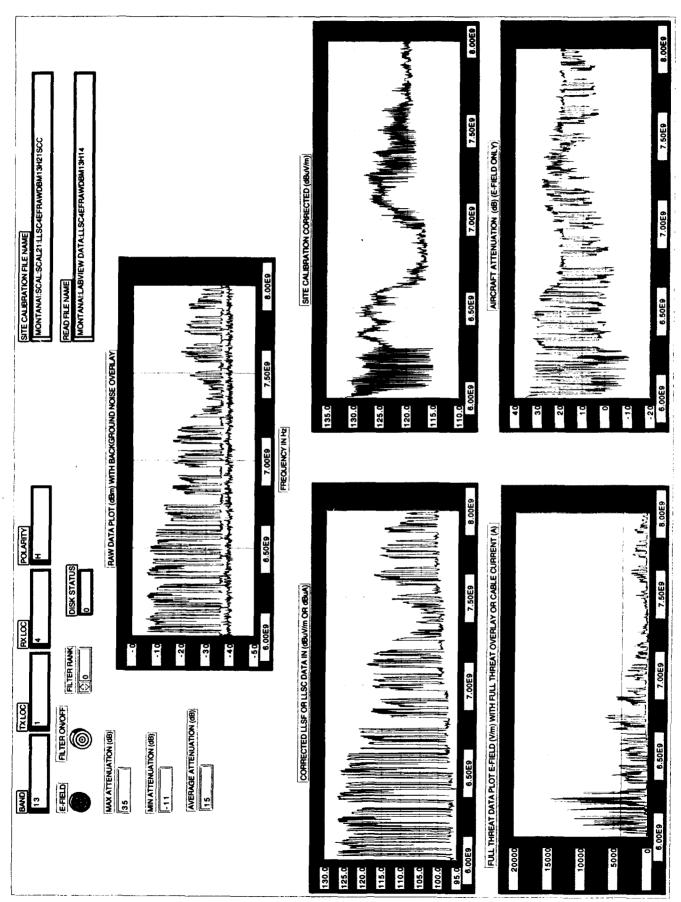


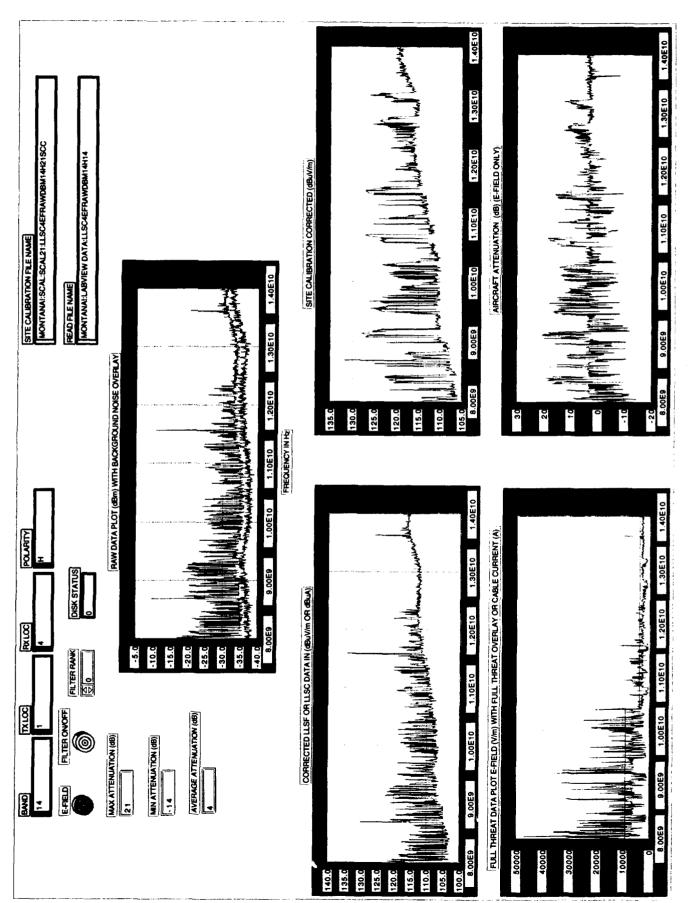


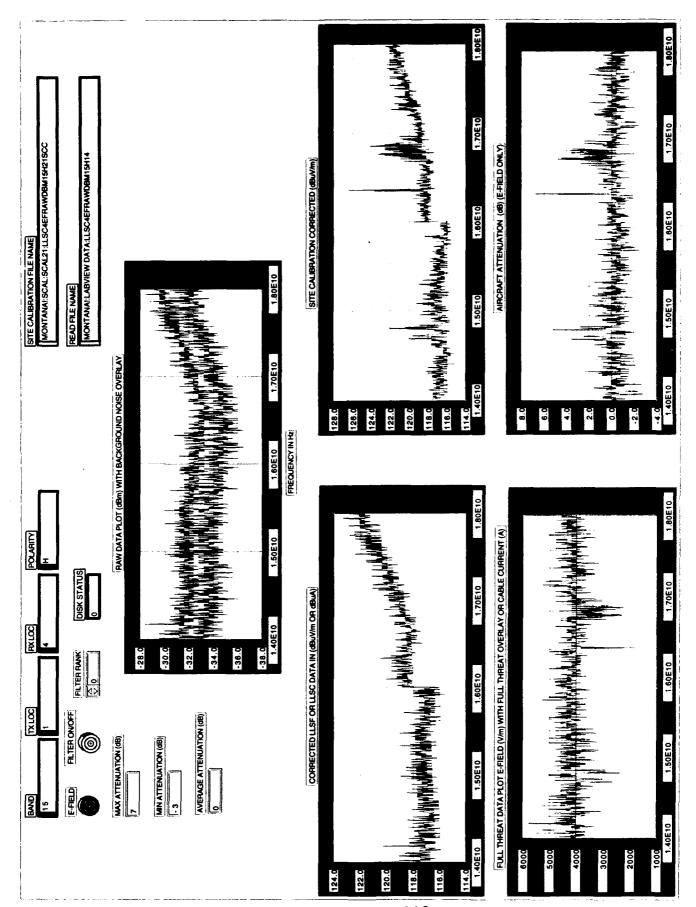


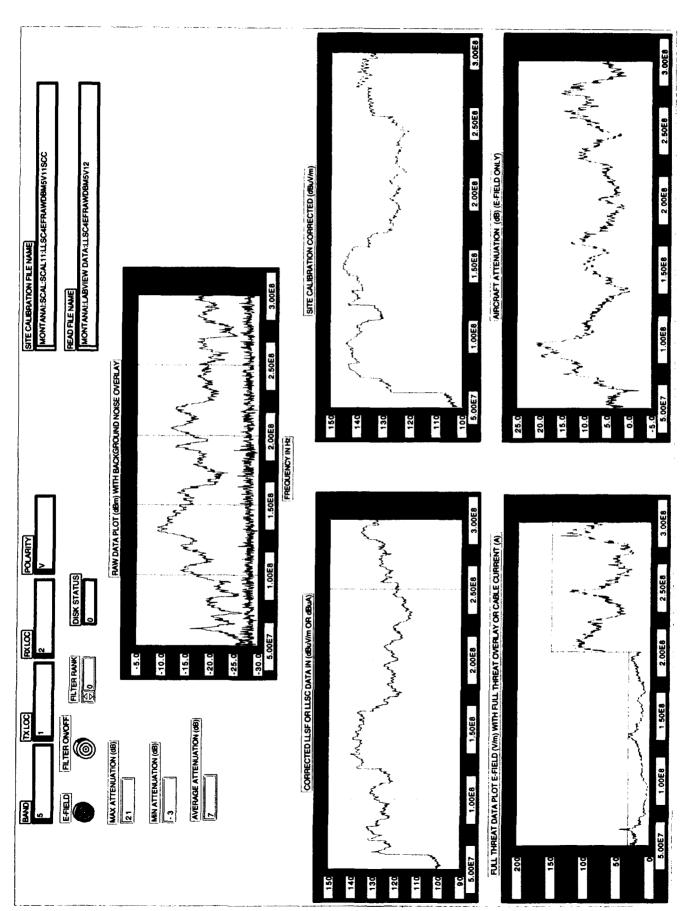


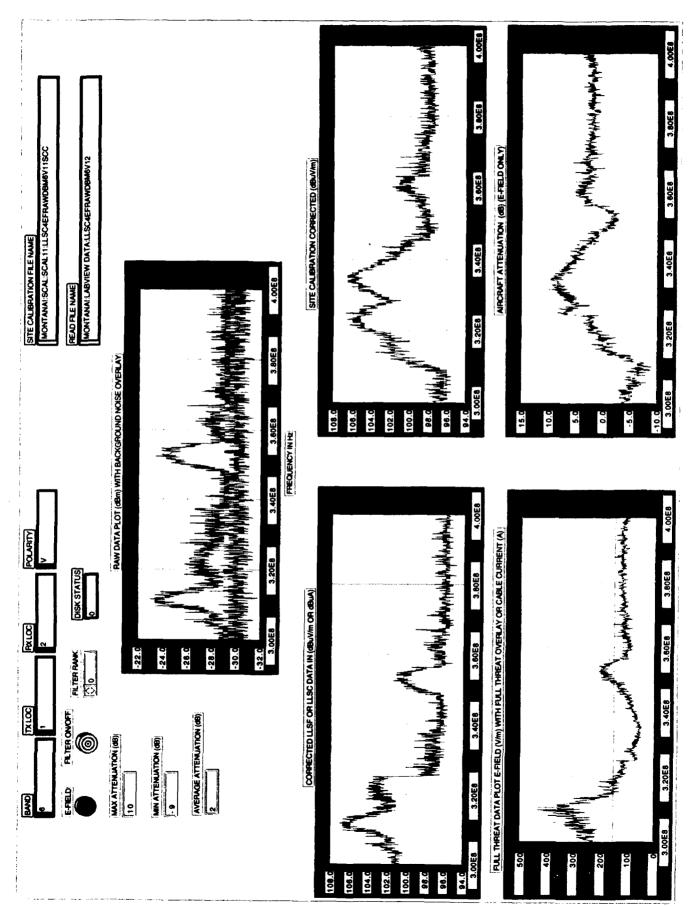


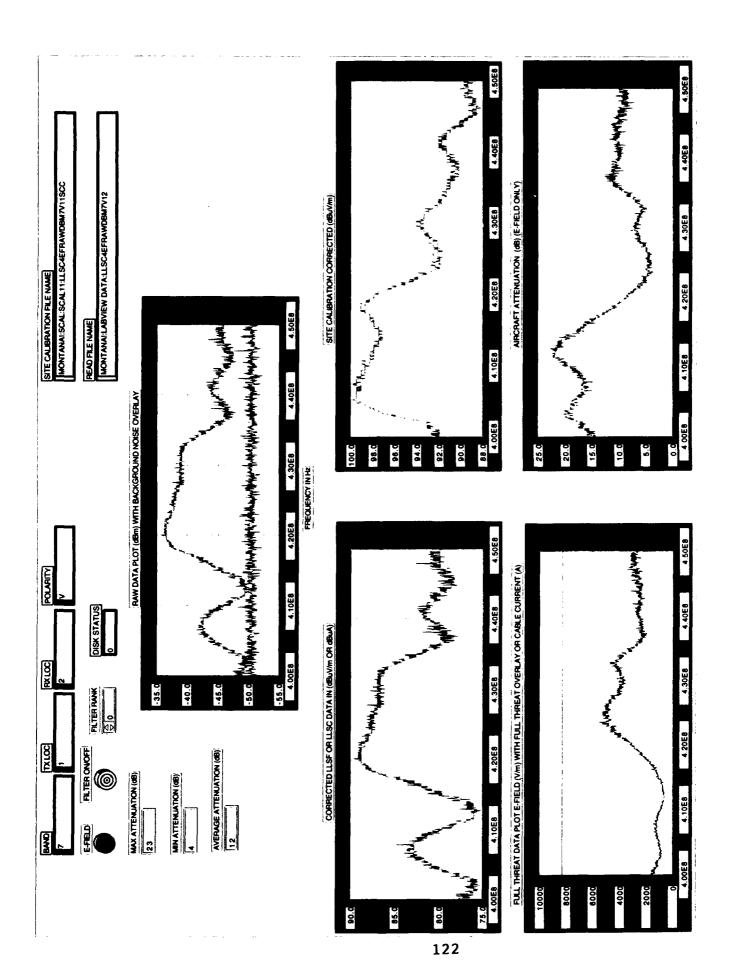


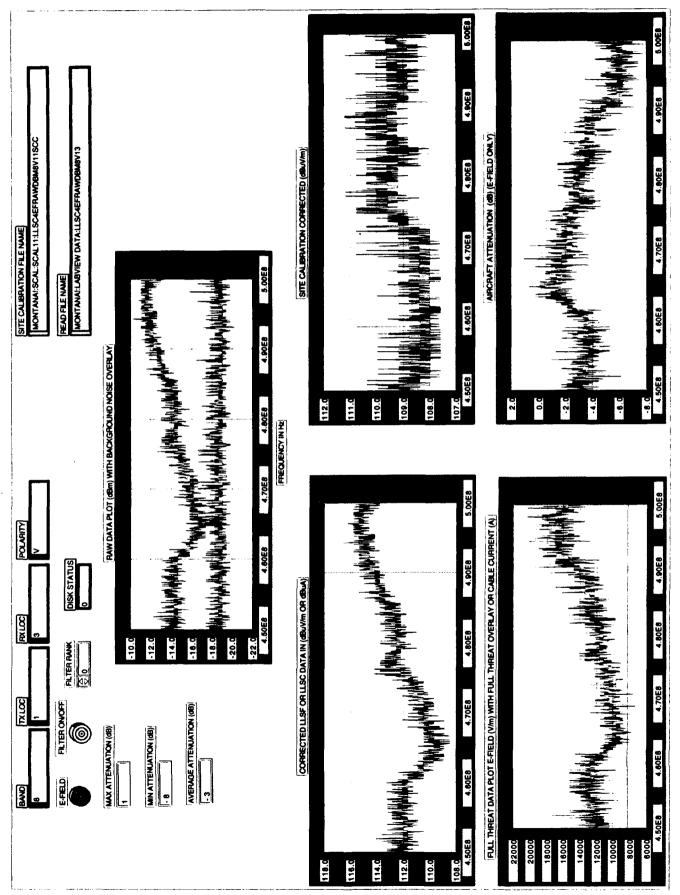


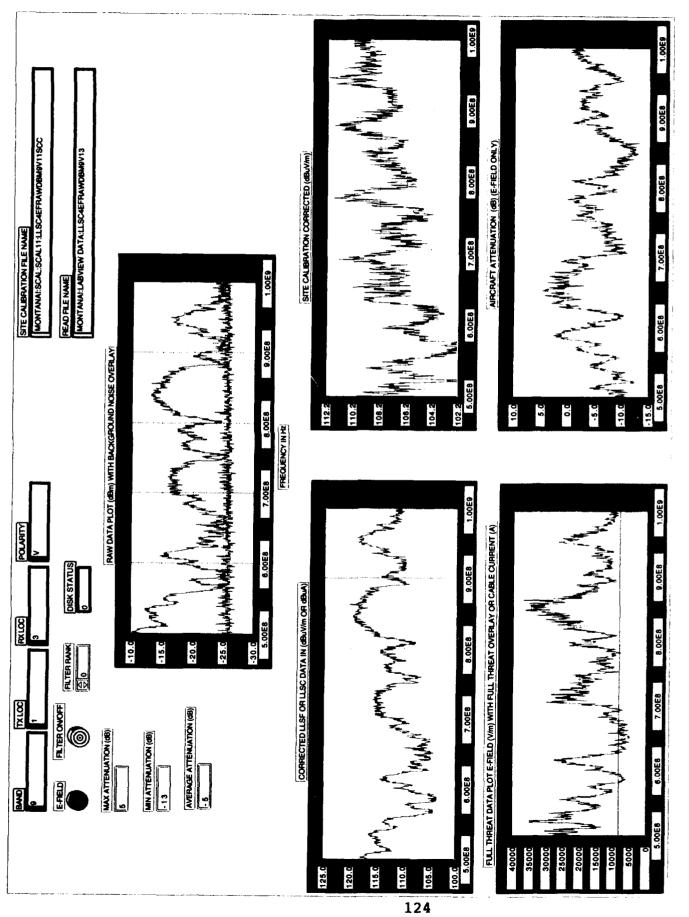


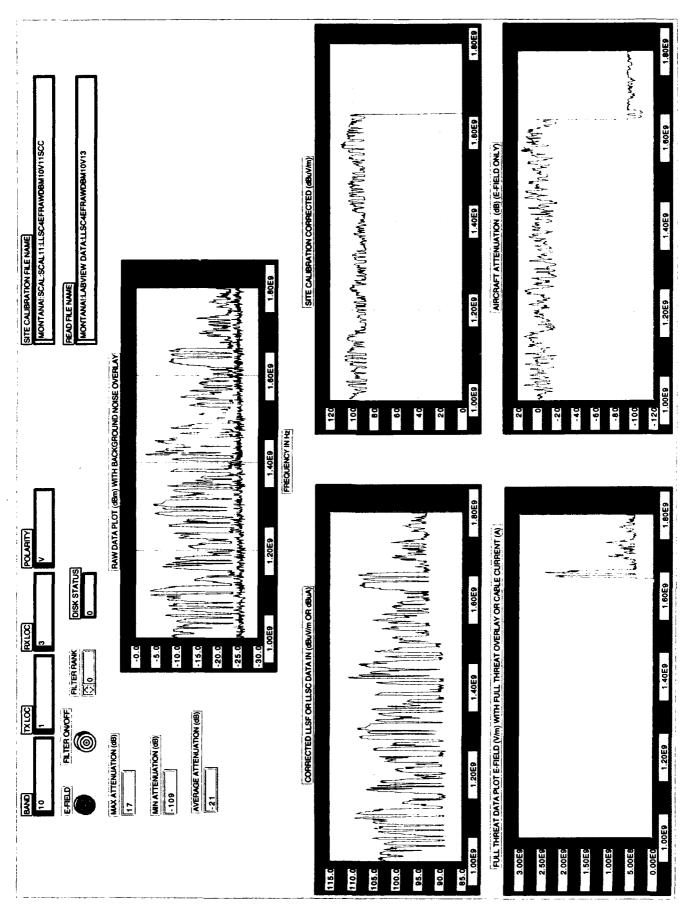


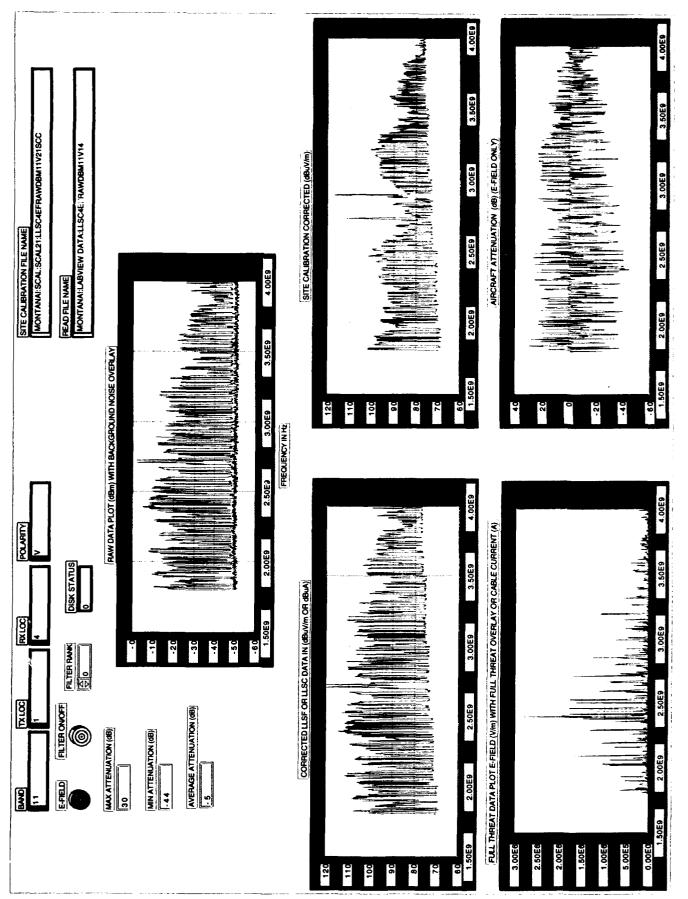


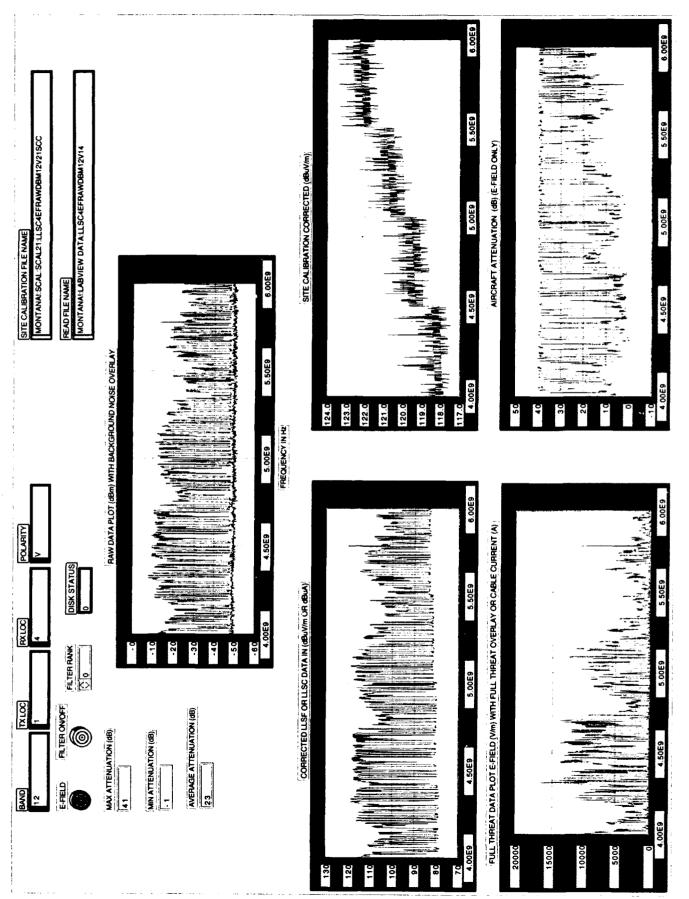


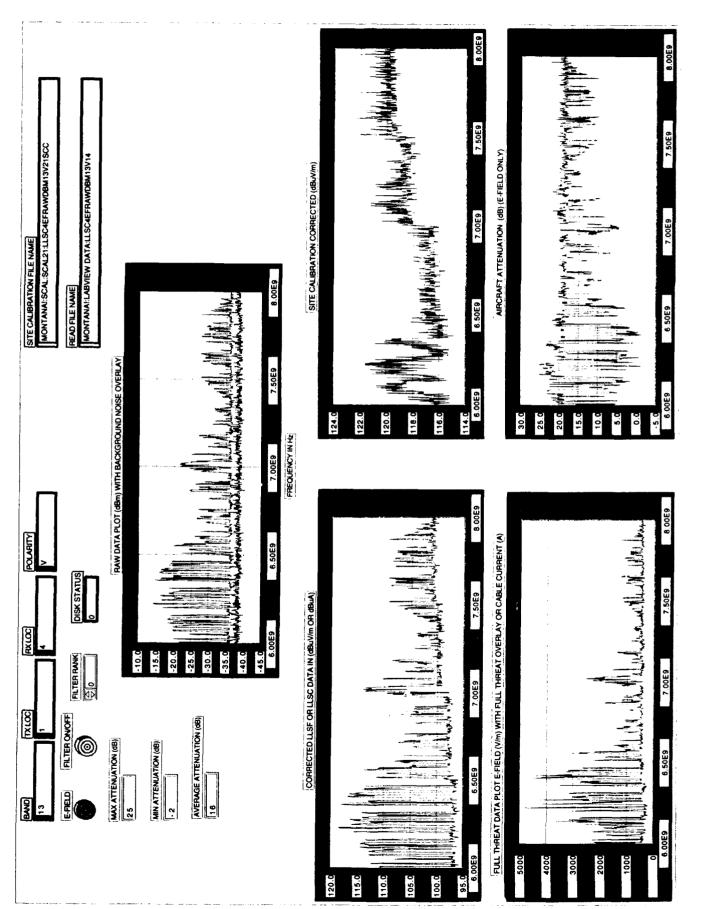


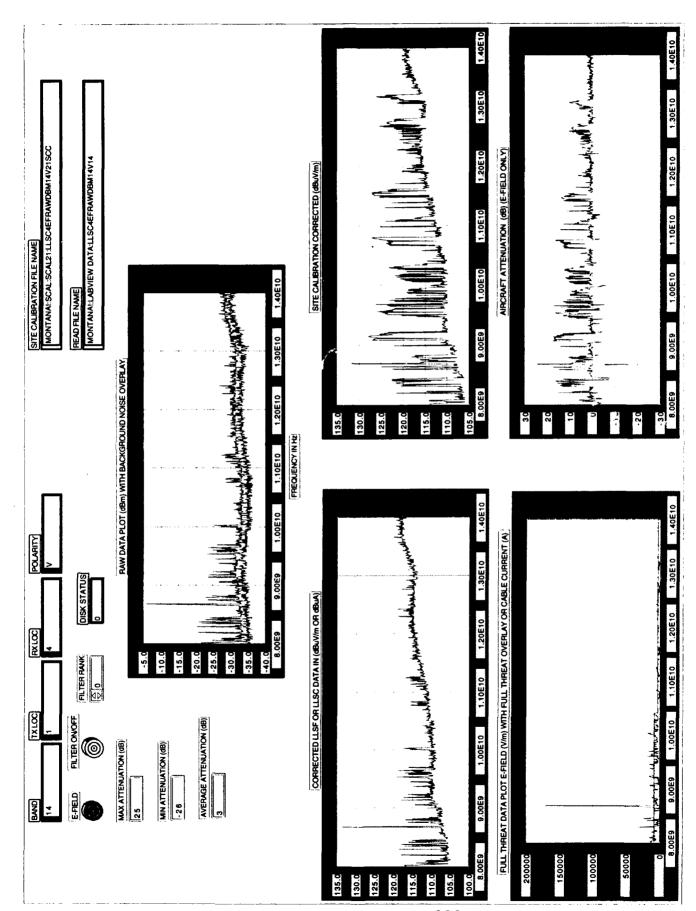


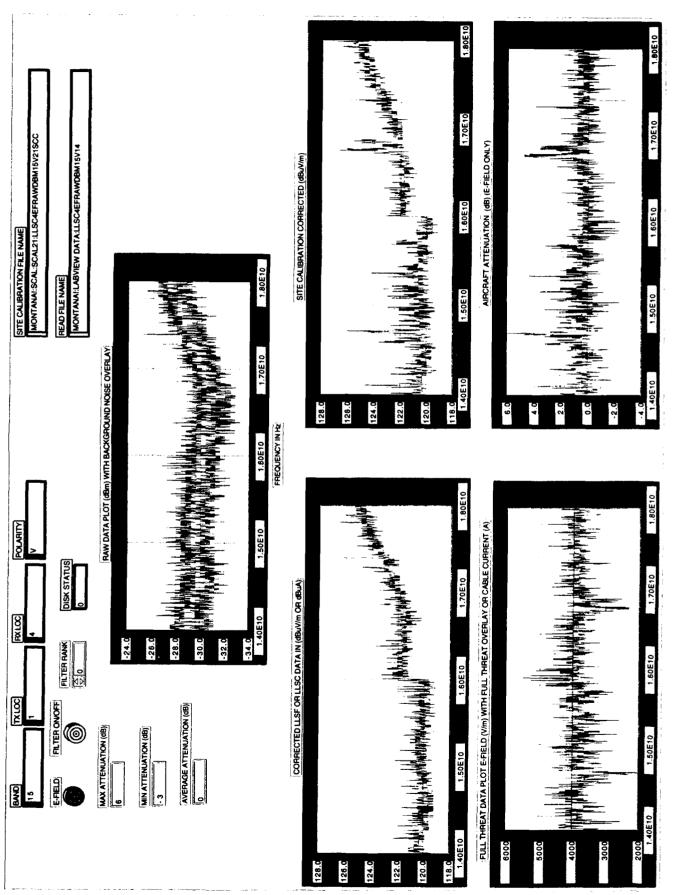


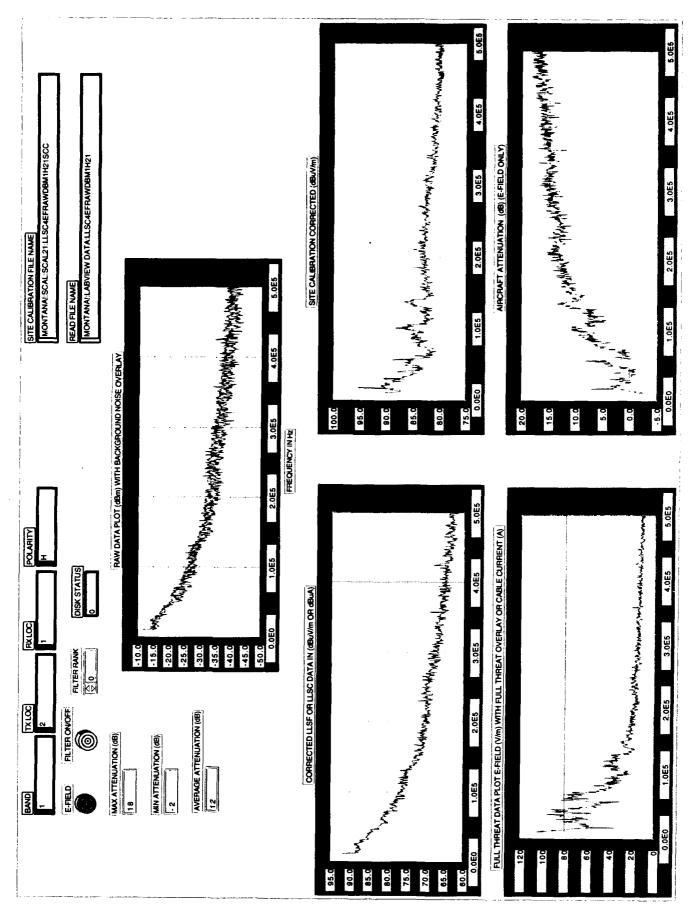


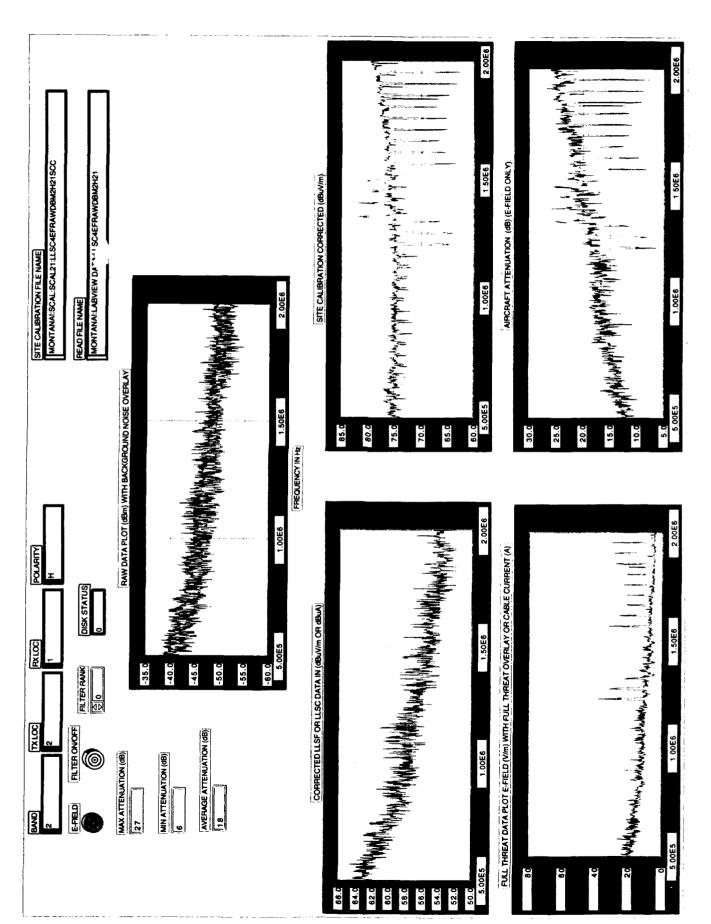


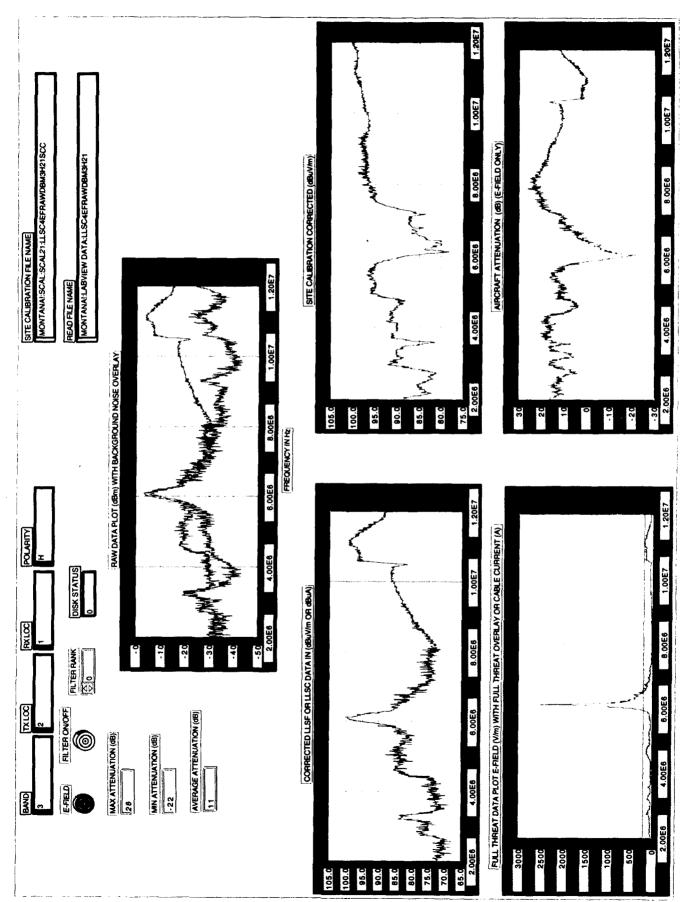


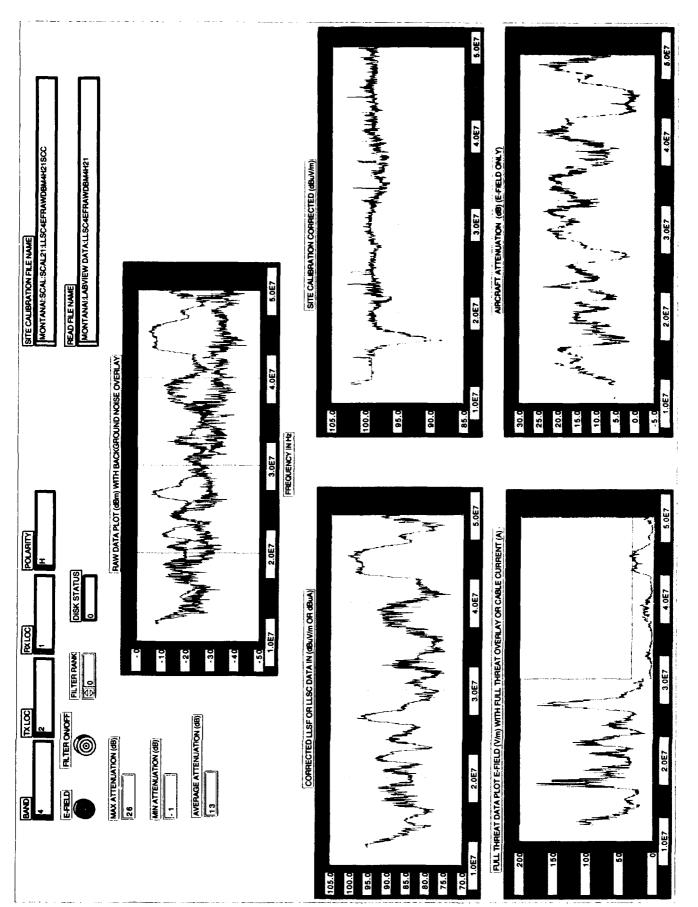


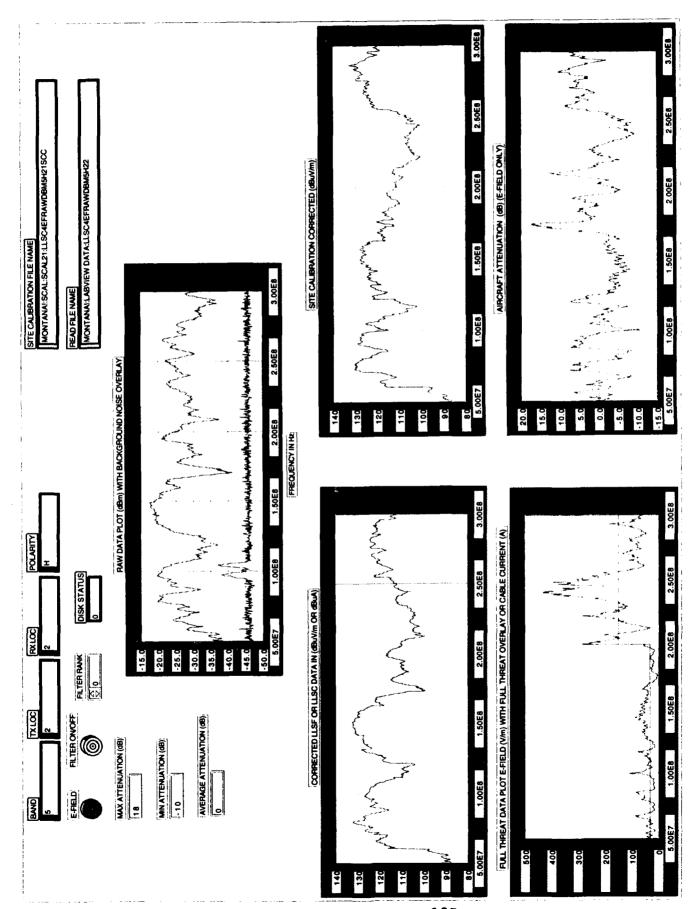


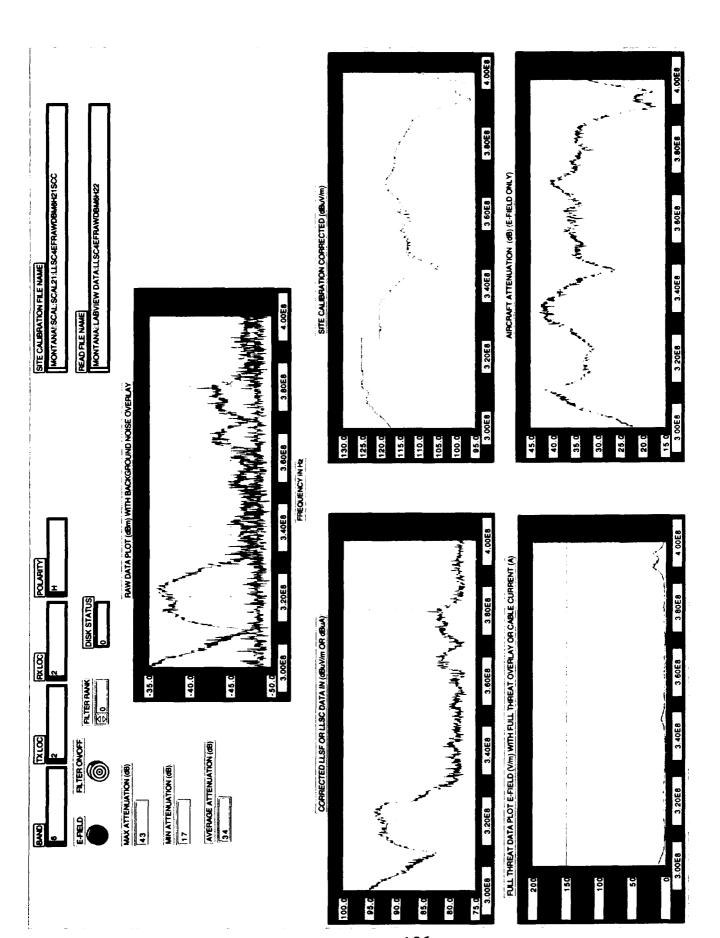


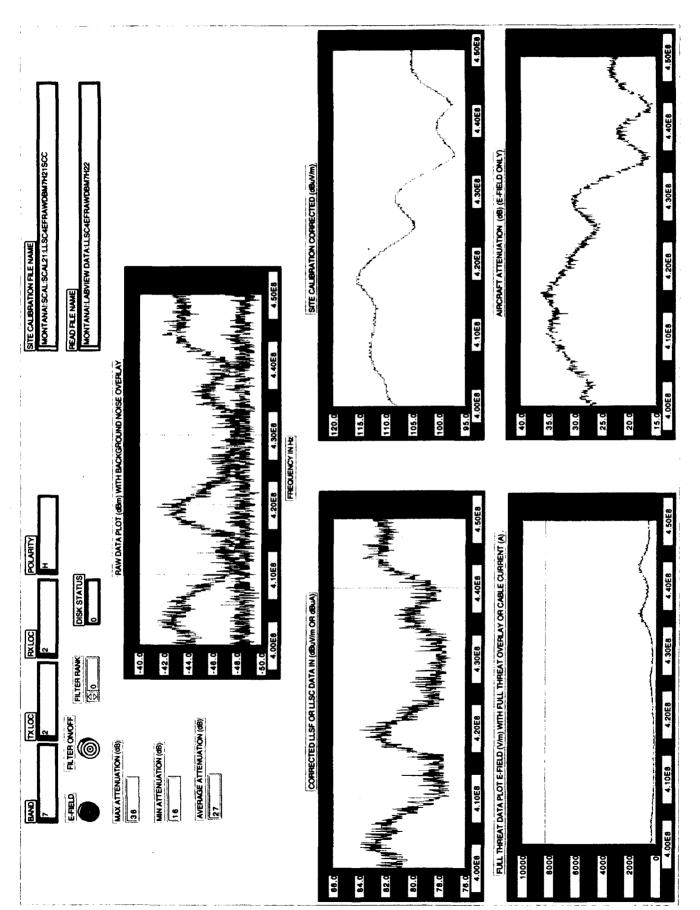


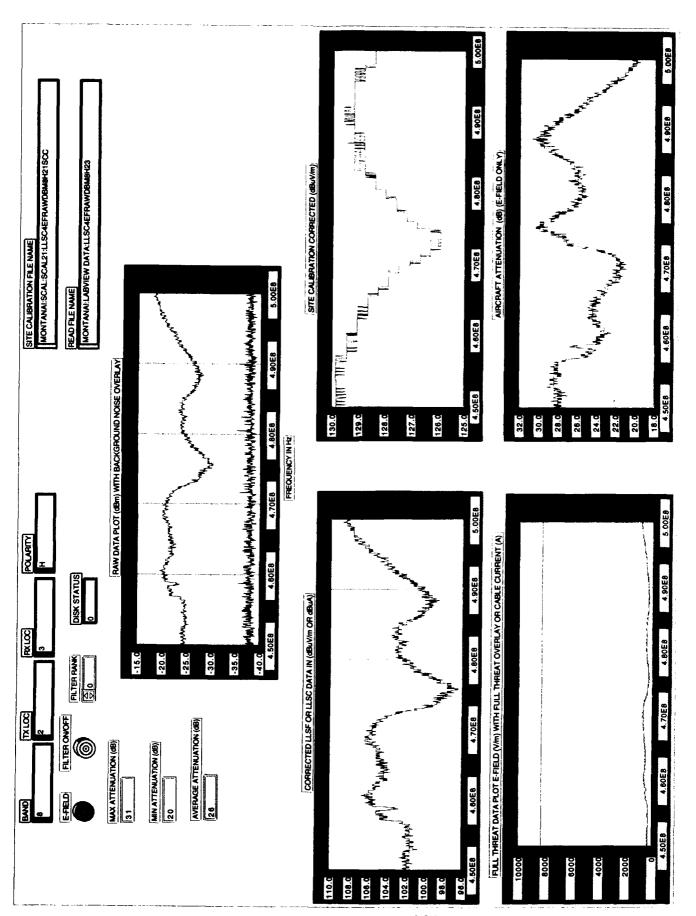


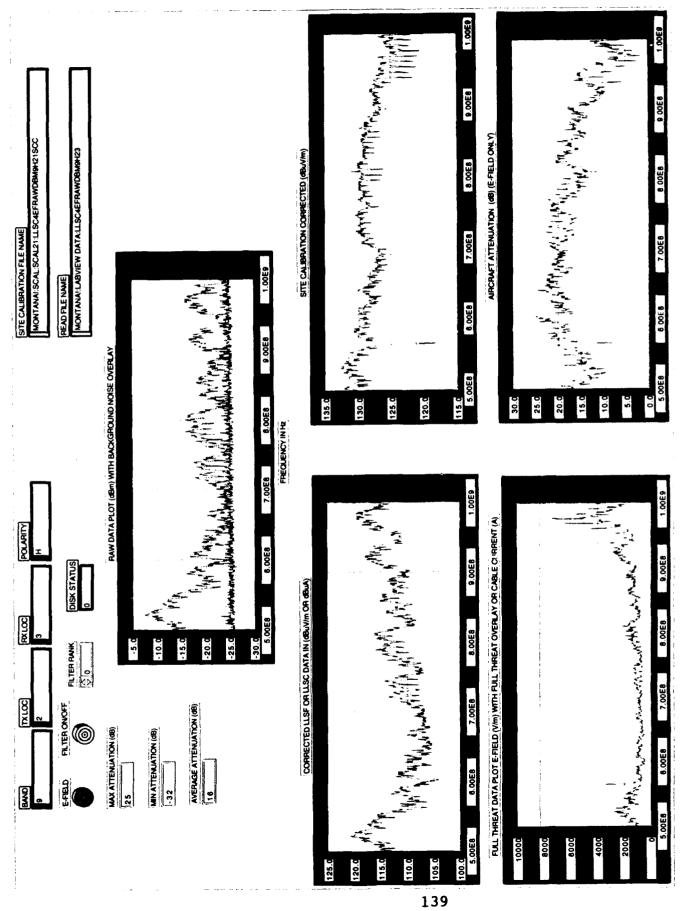


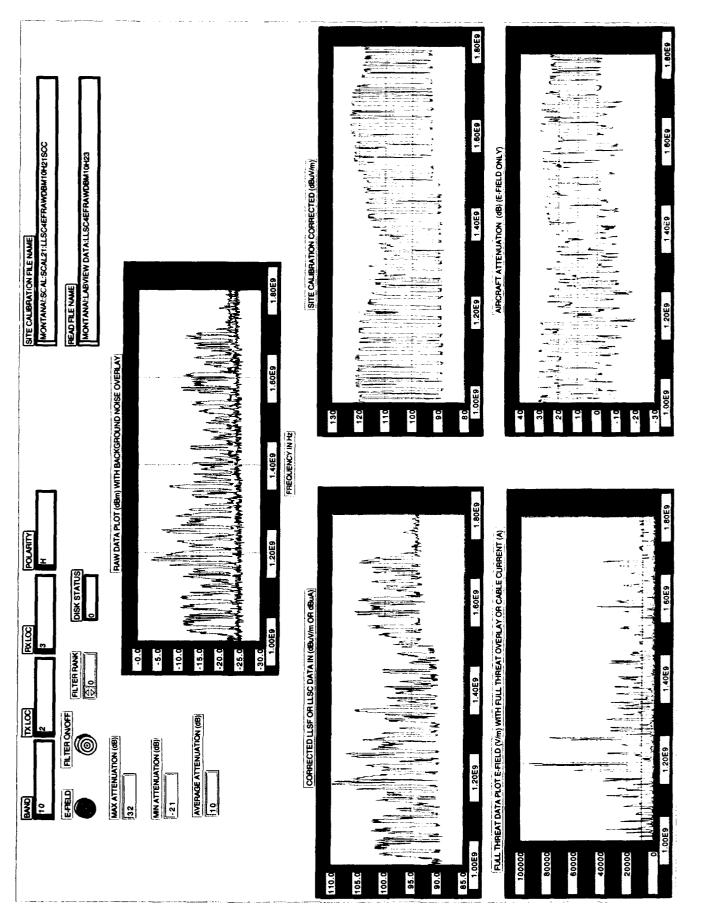


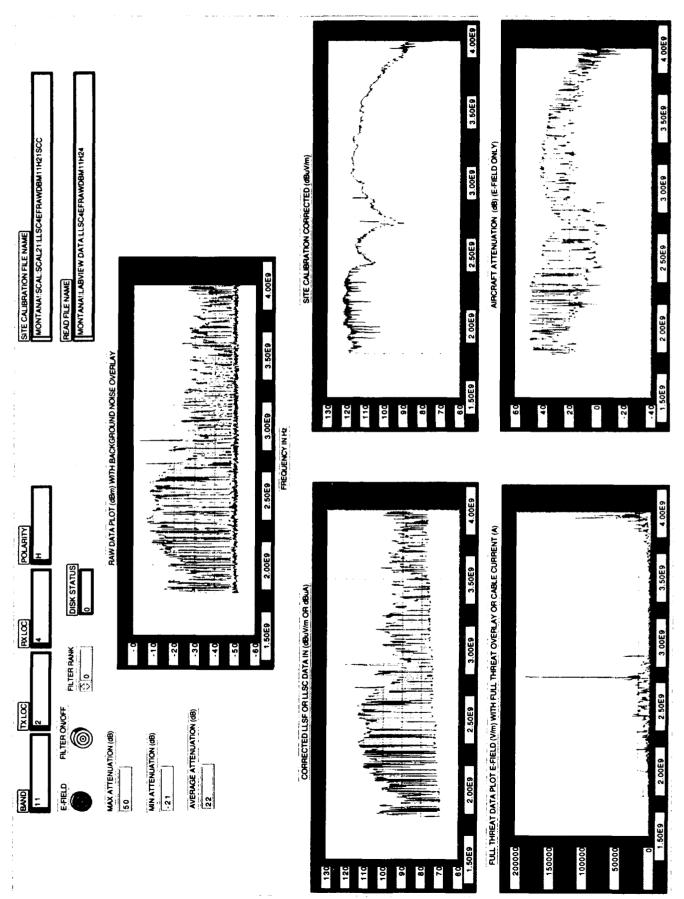


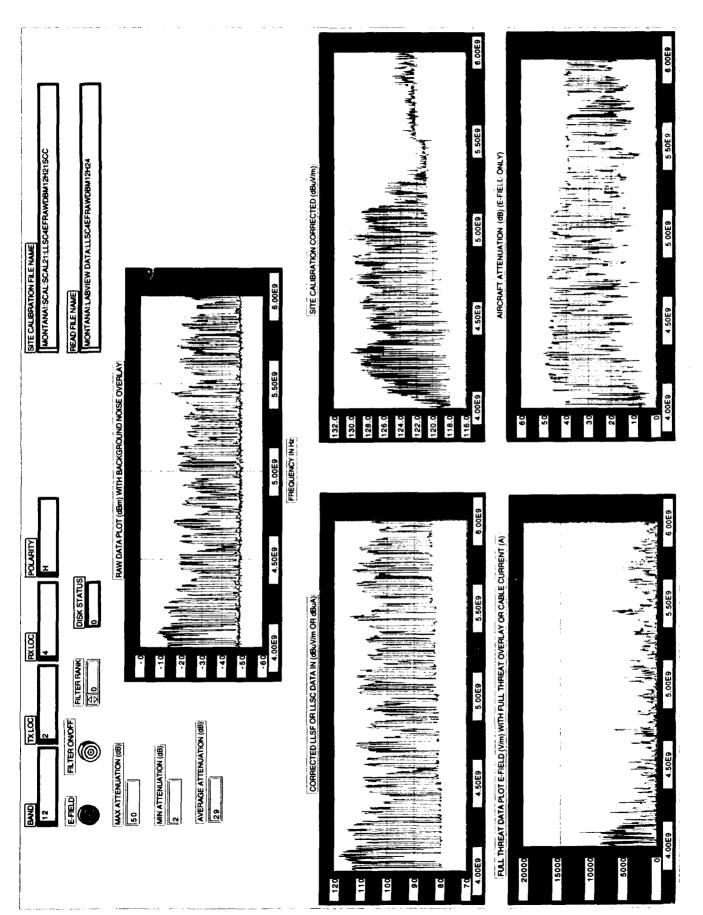


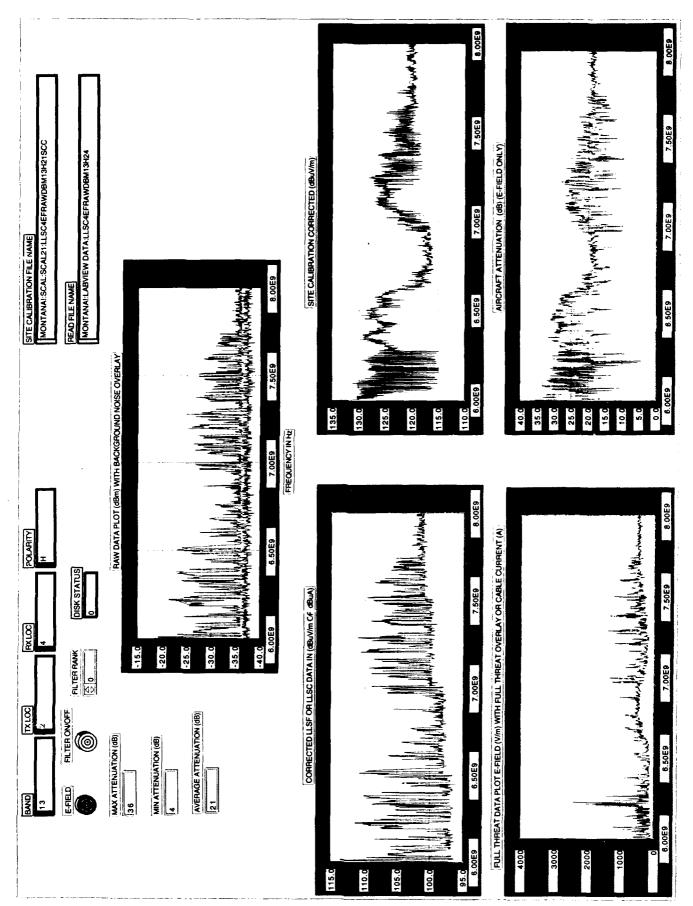


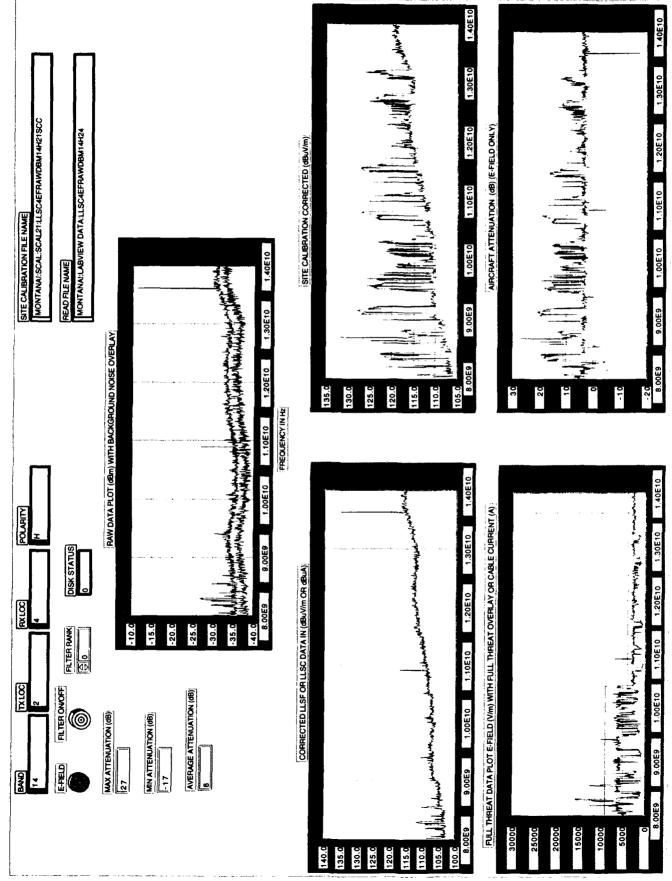


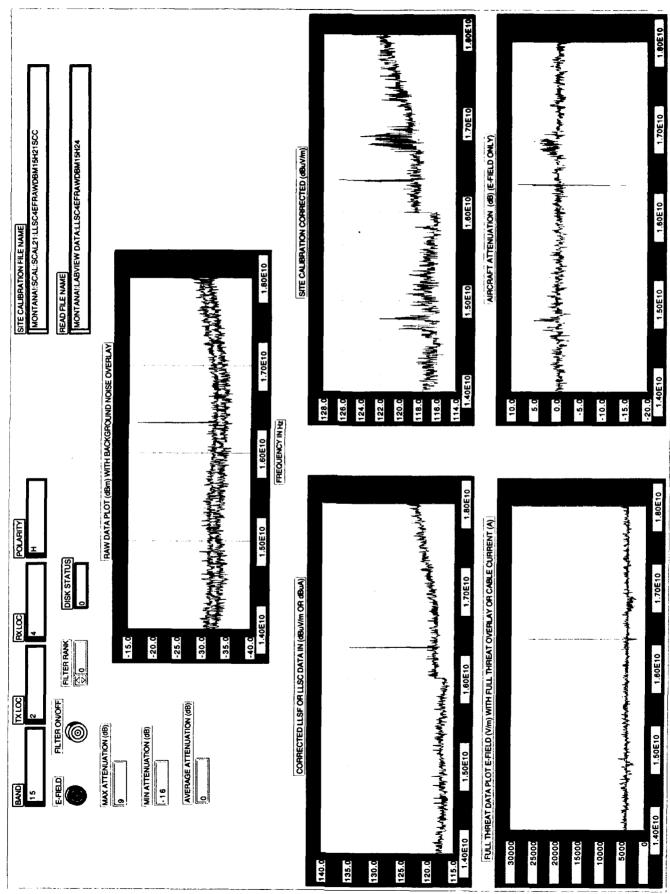


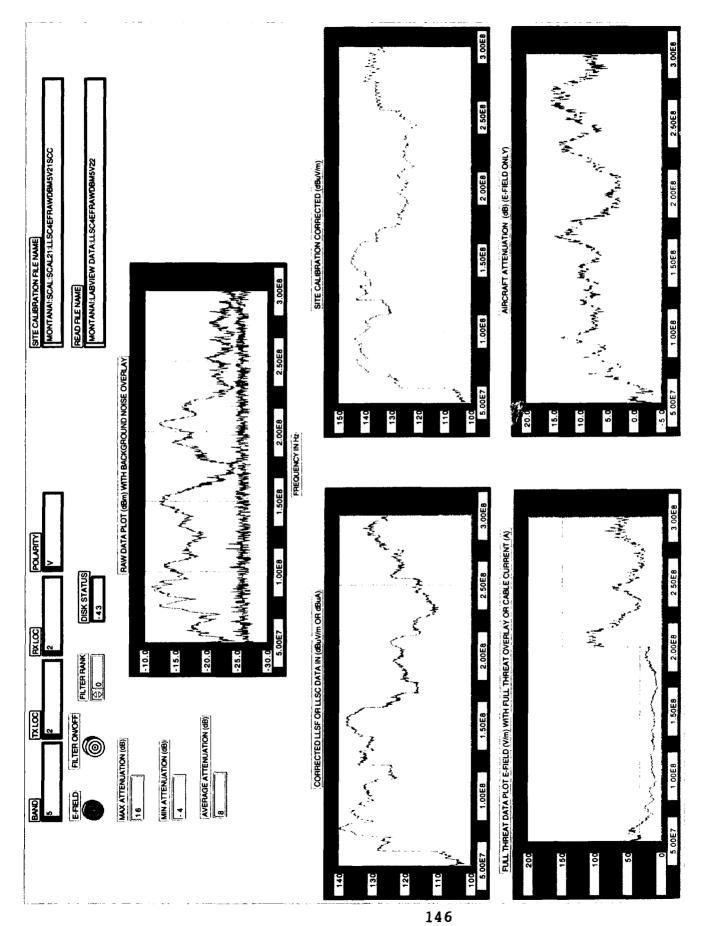


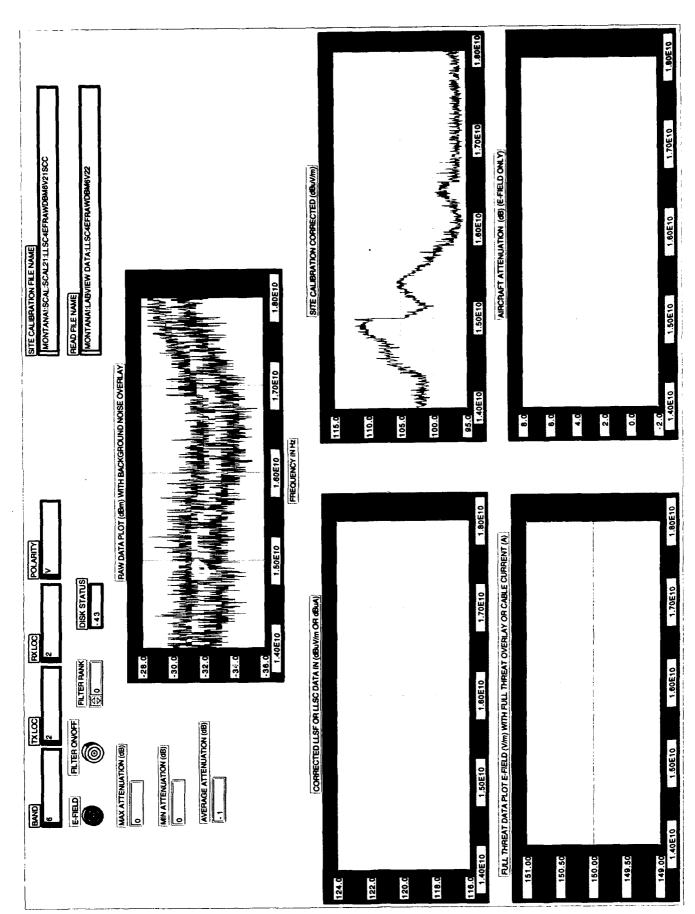


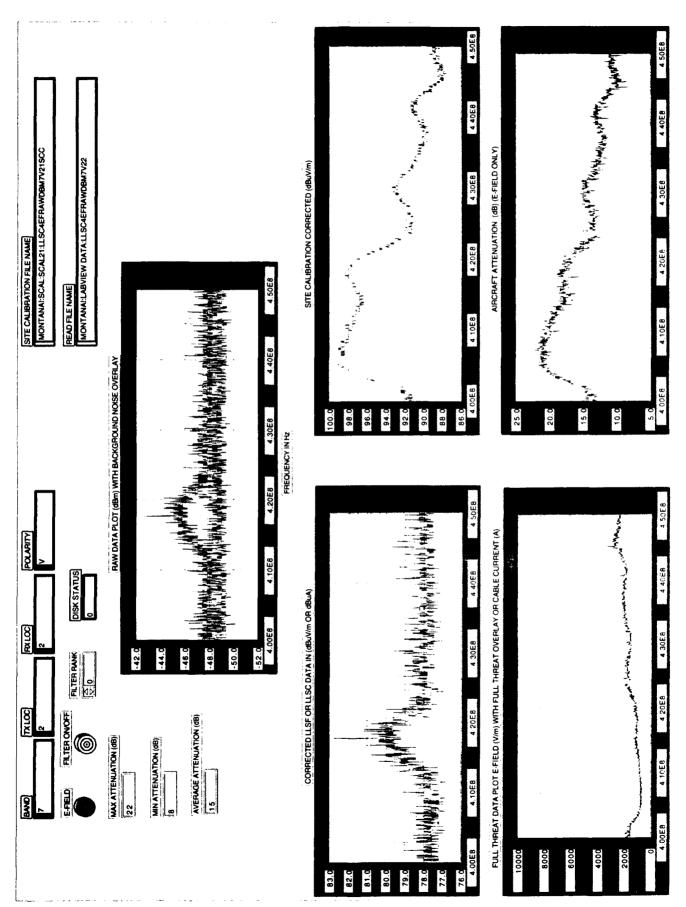


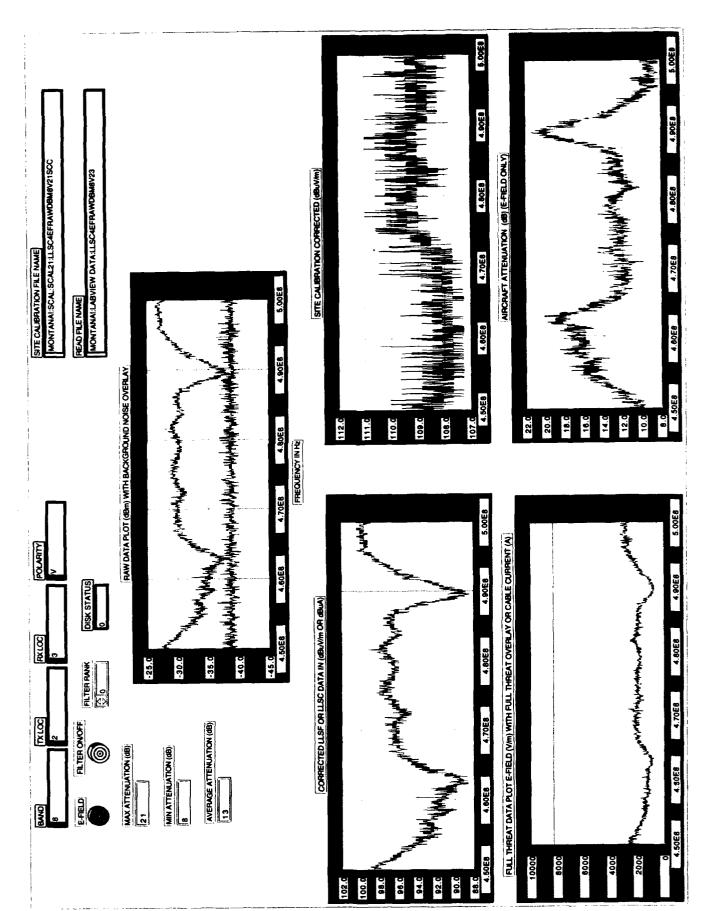


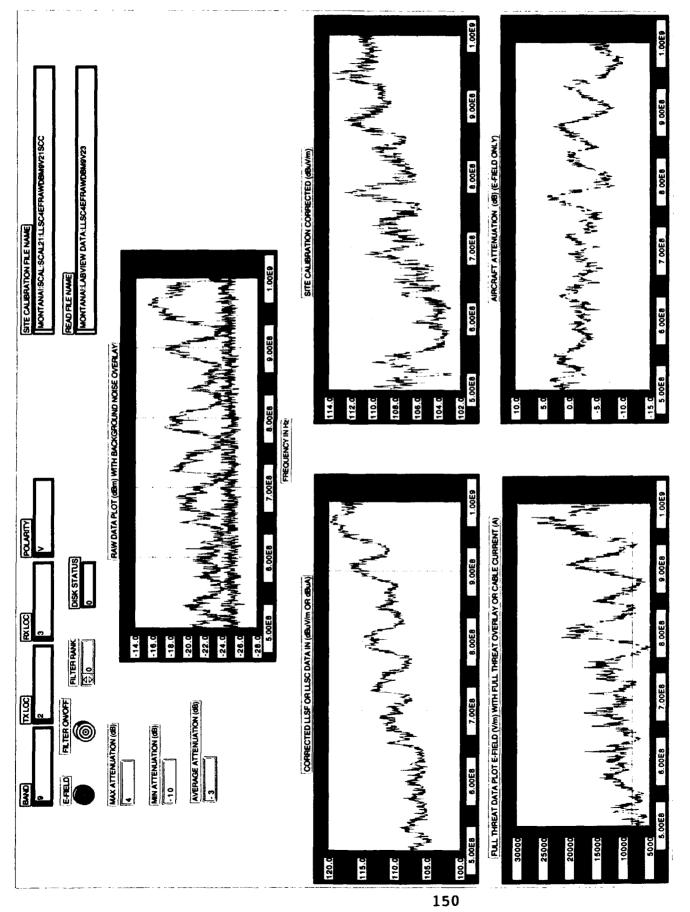


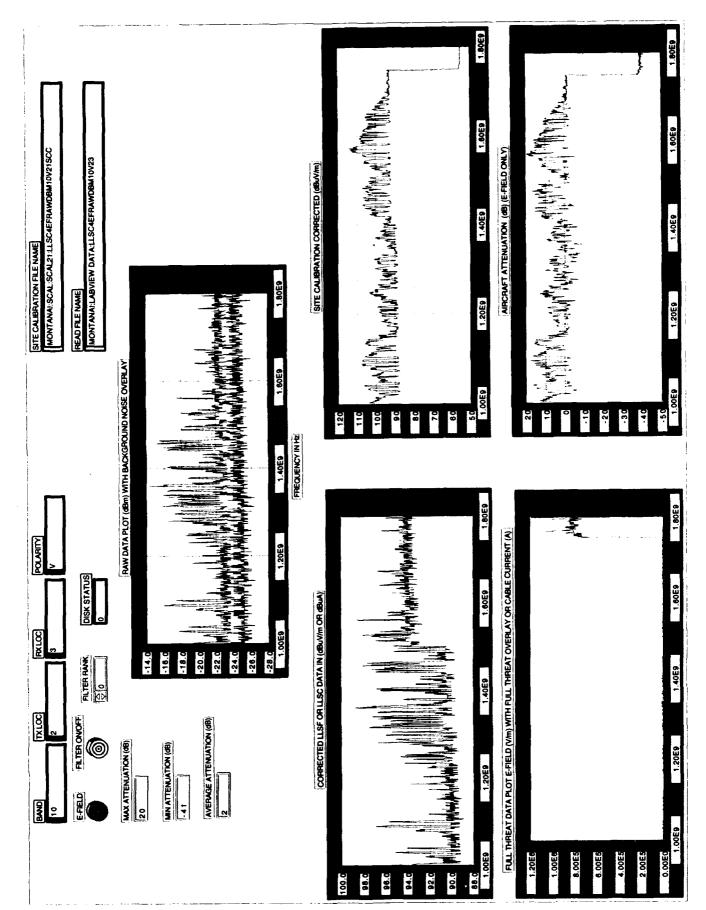


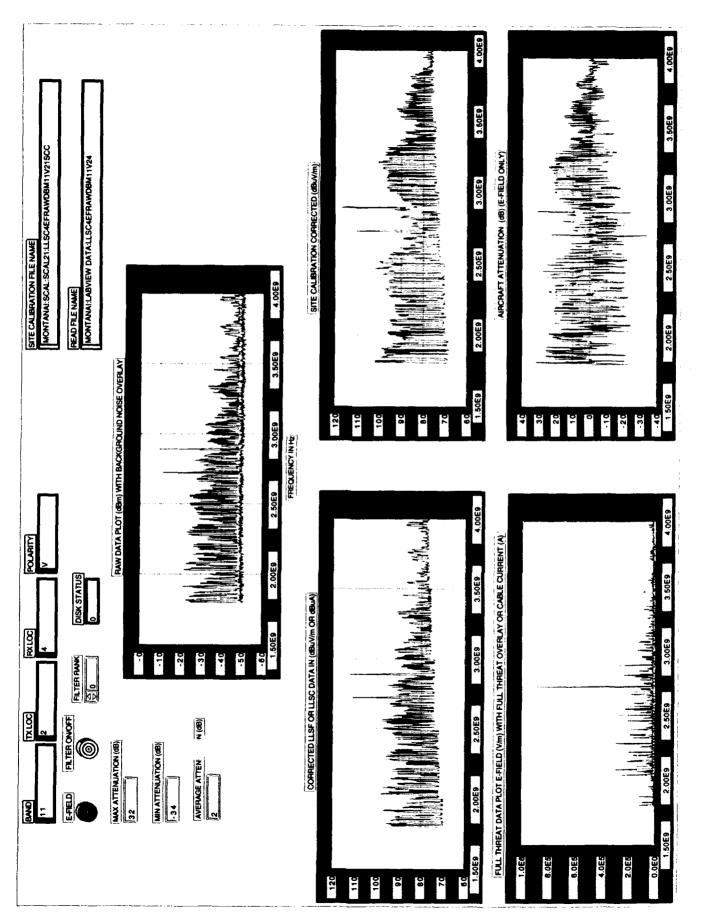


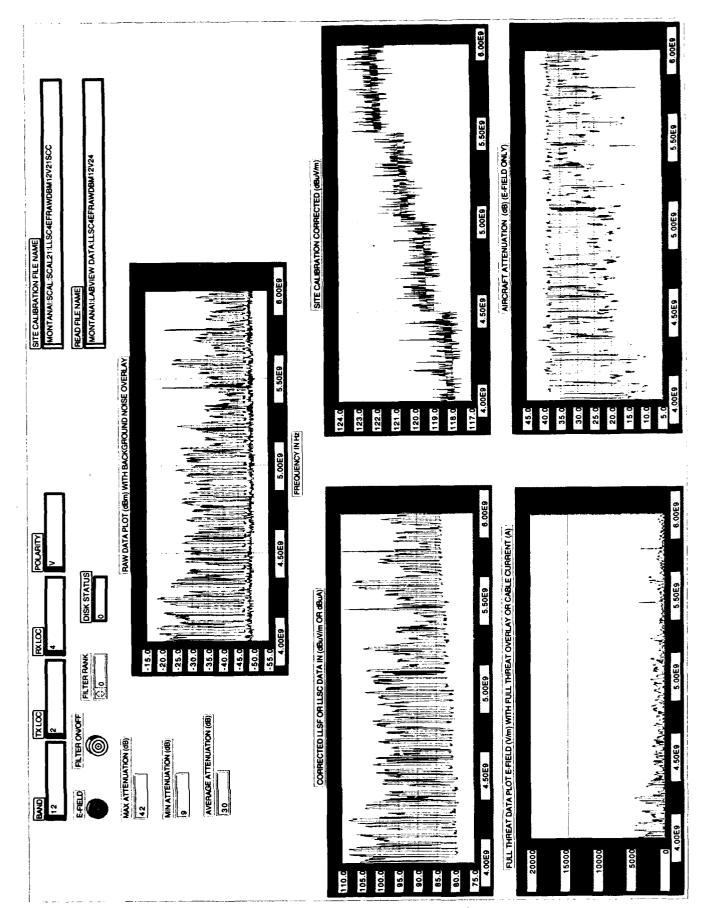


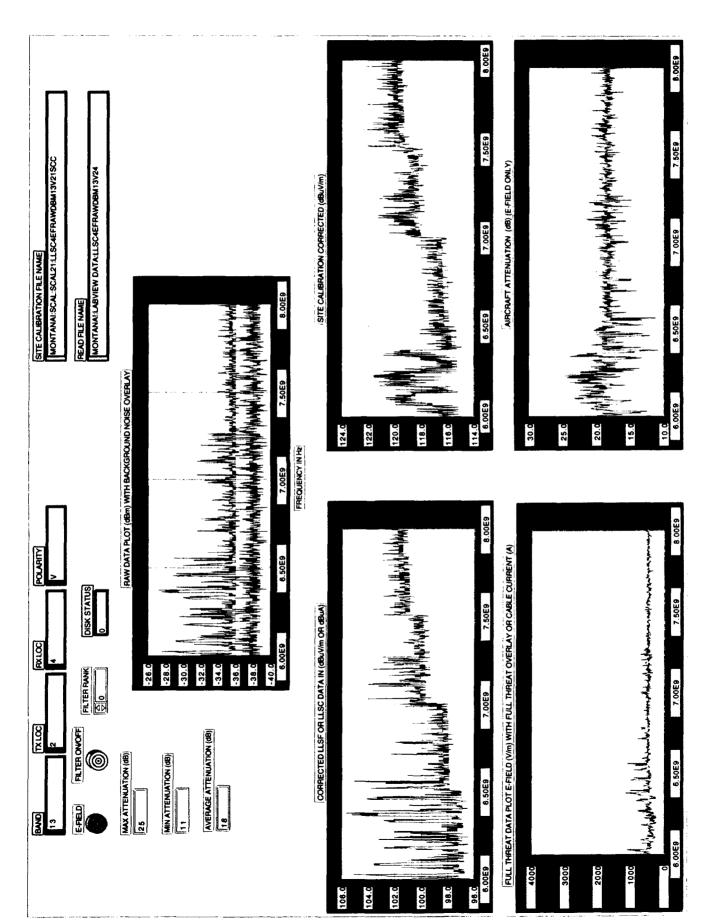


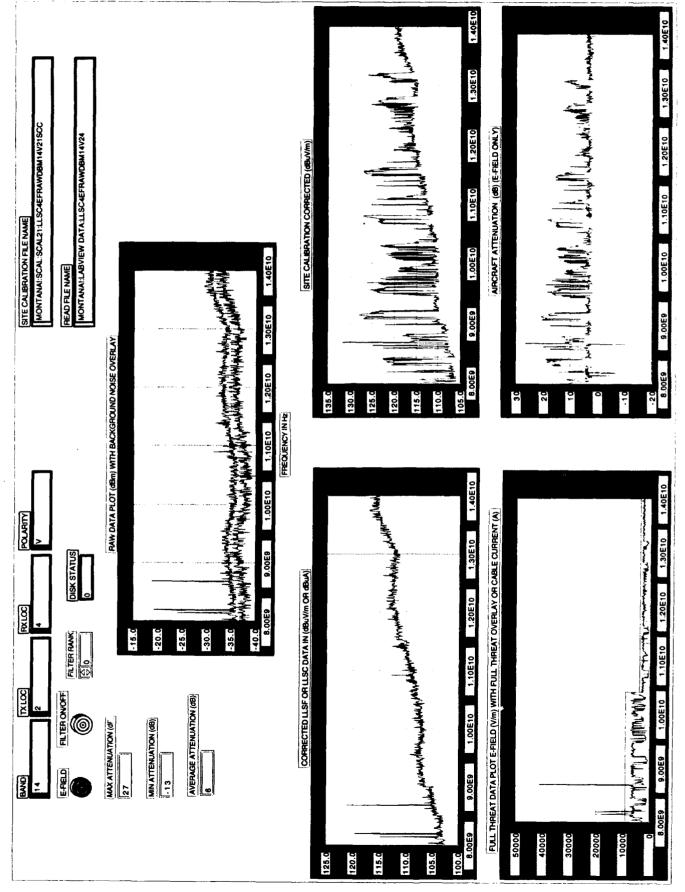


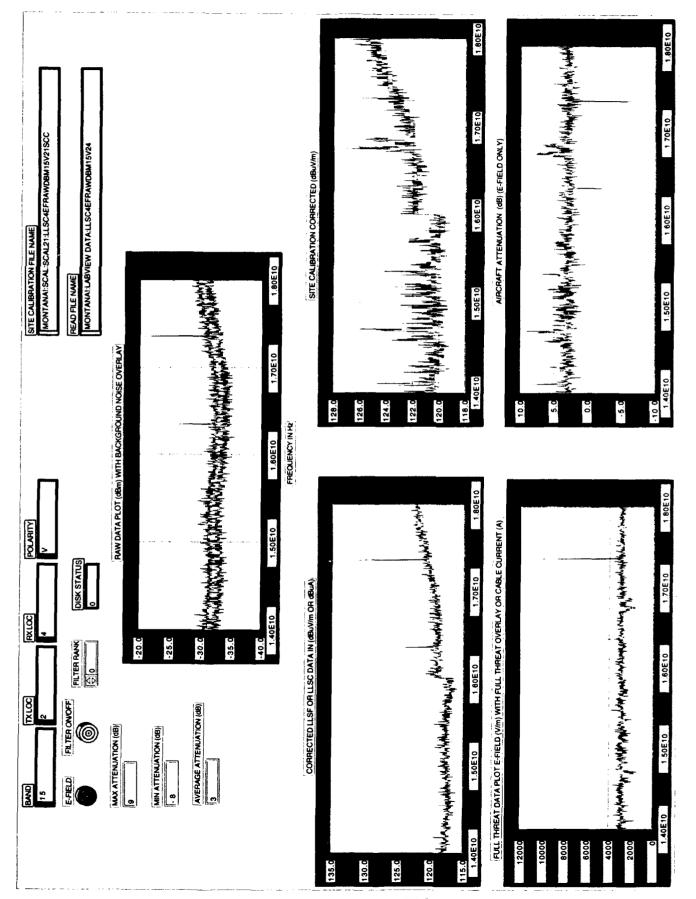




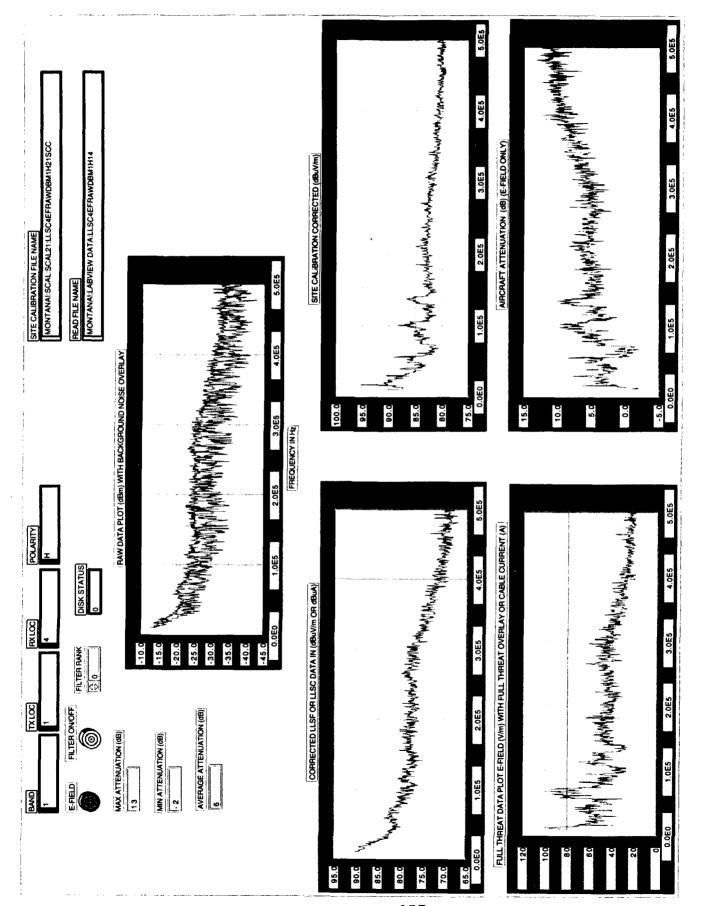


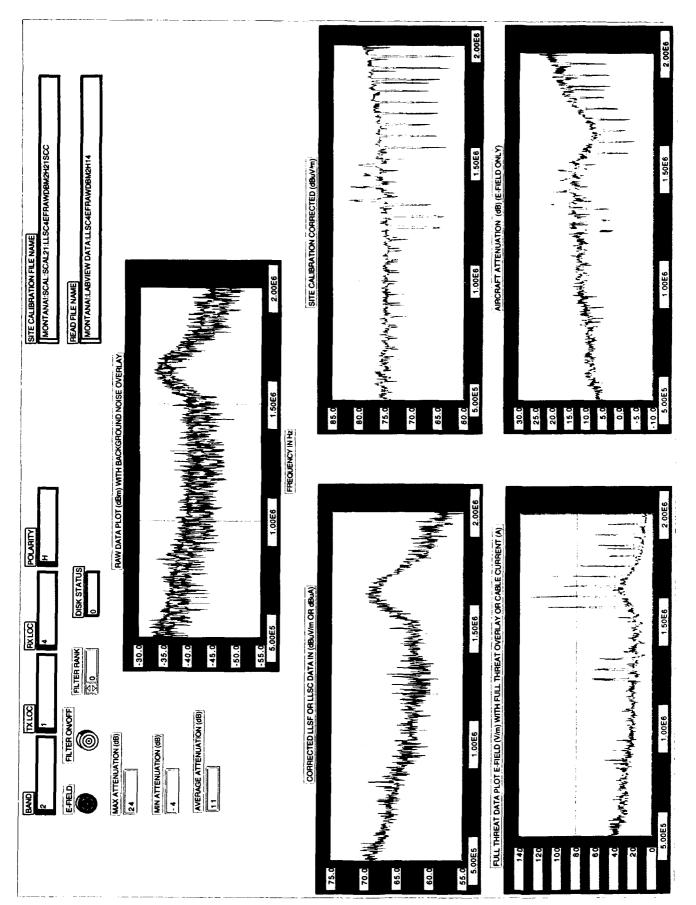


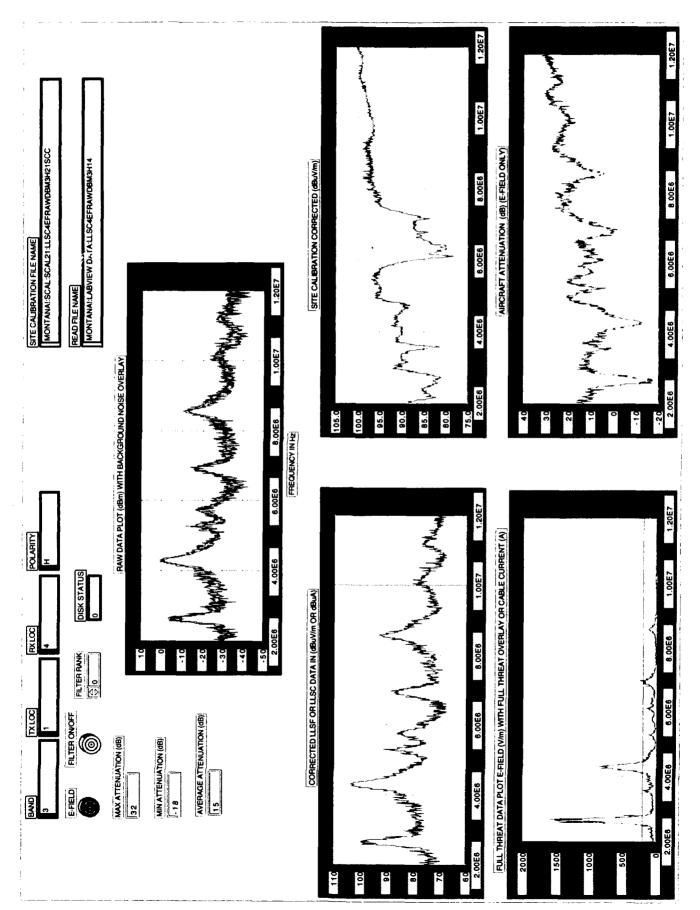


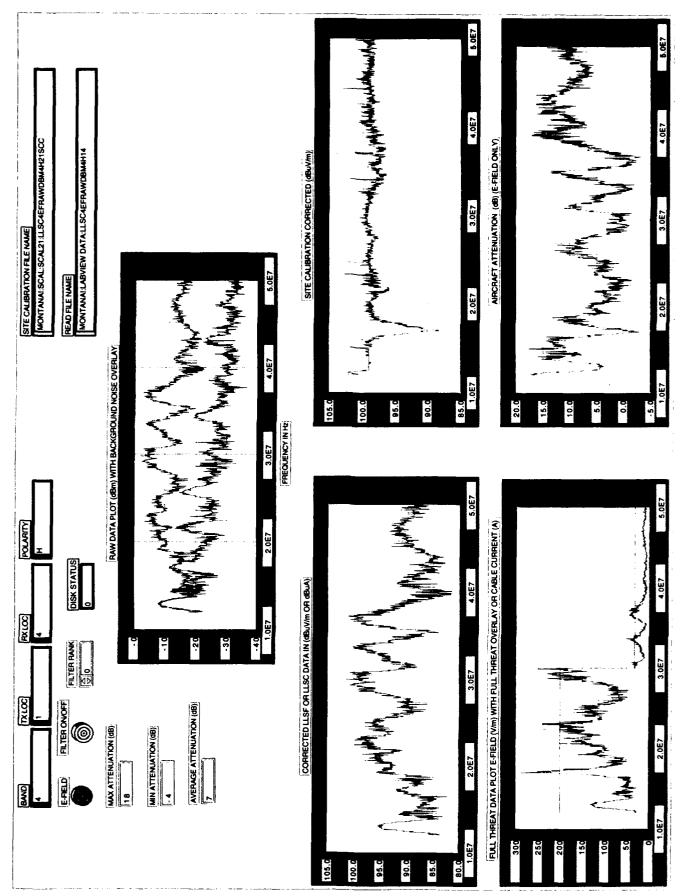


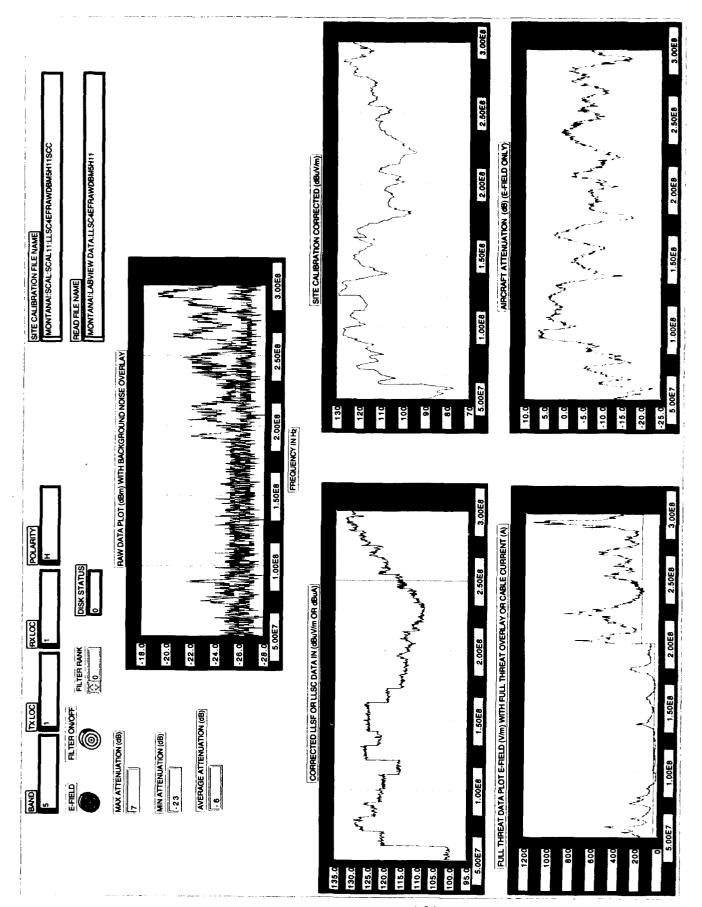
SECTION 1-4 CARGO AREA LLSF DATA PLOTS

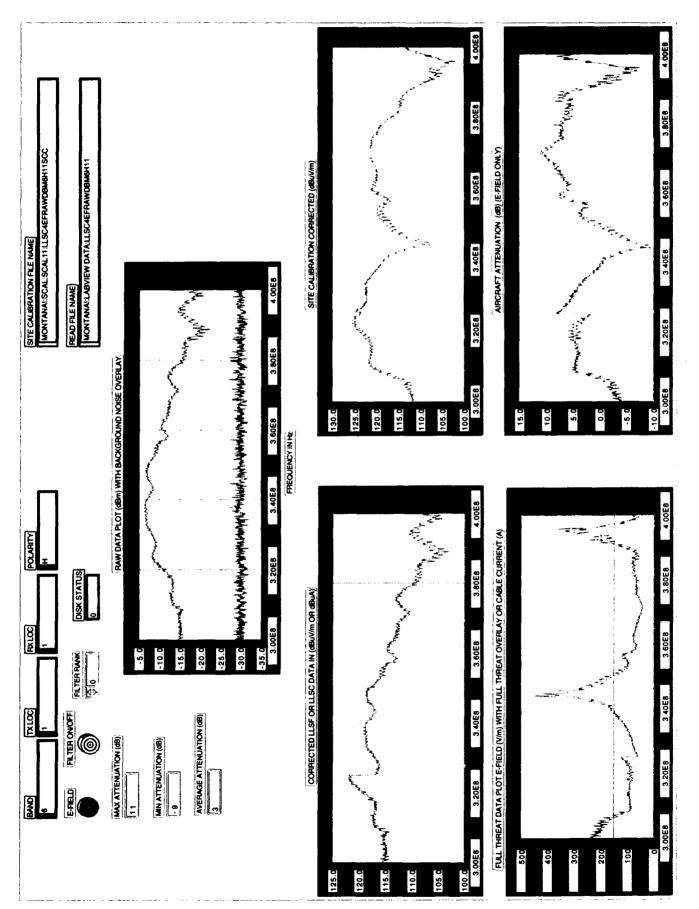


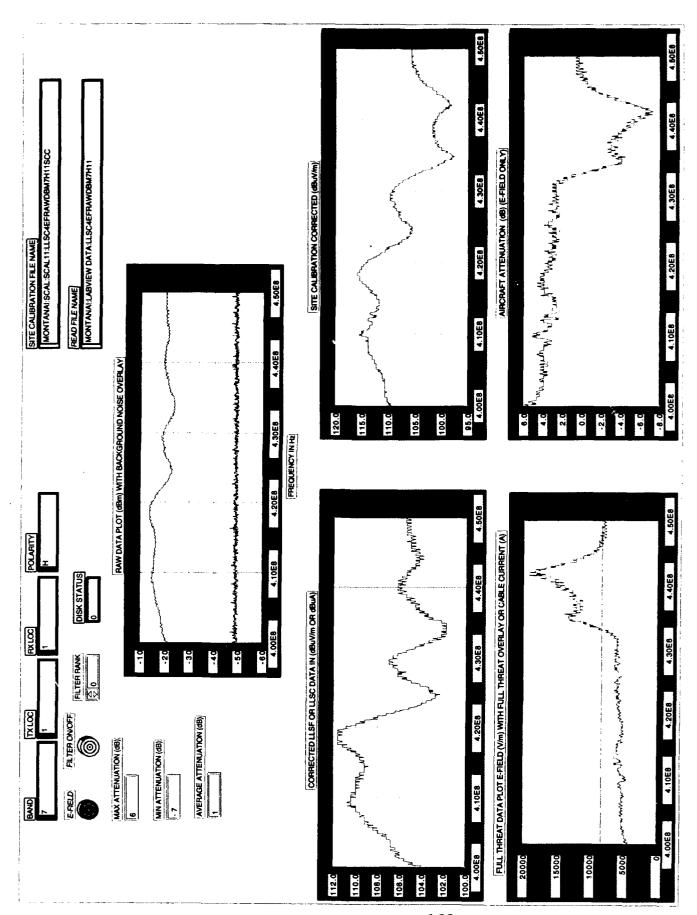


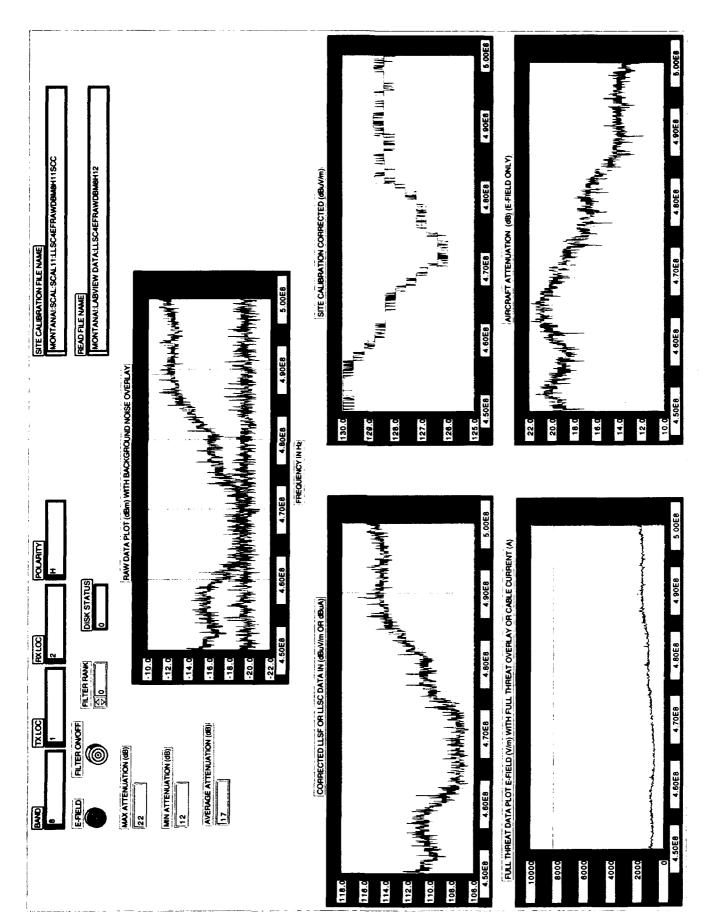


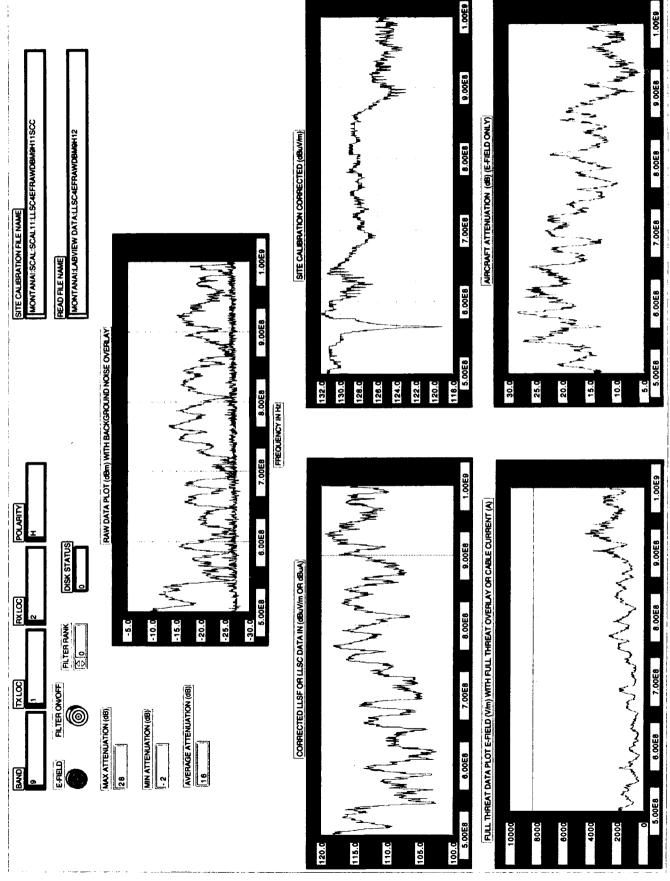


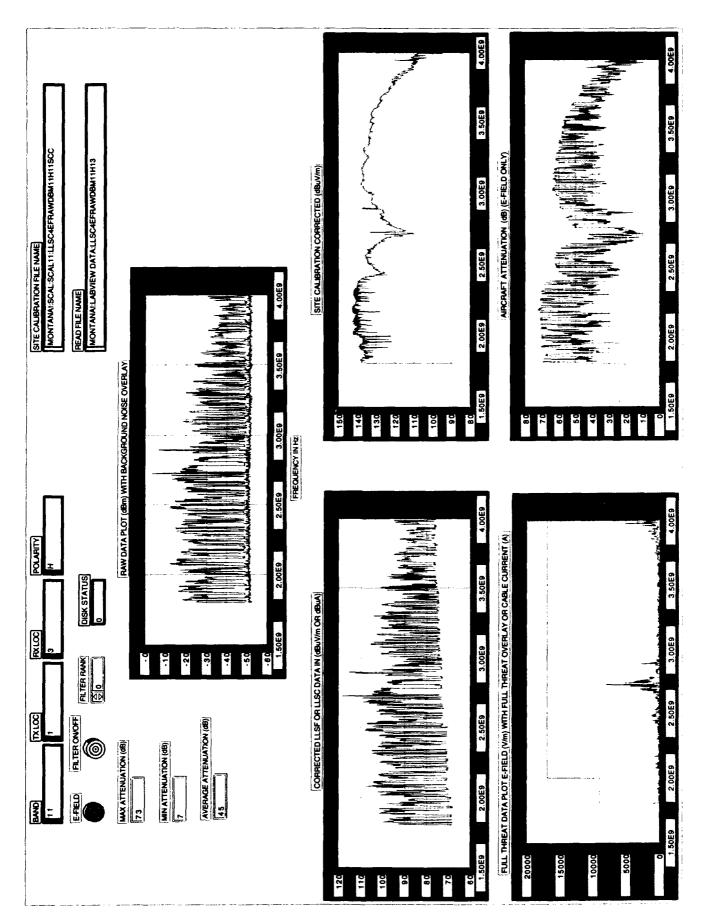


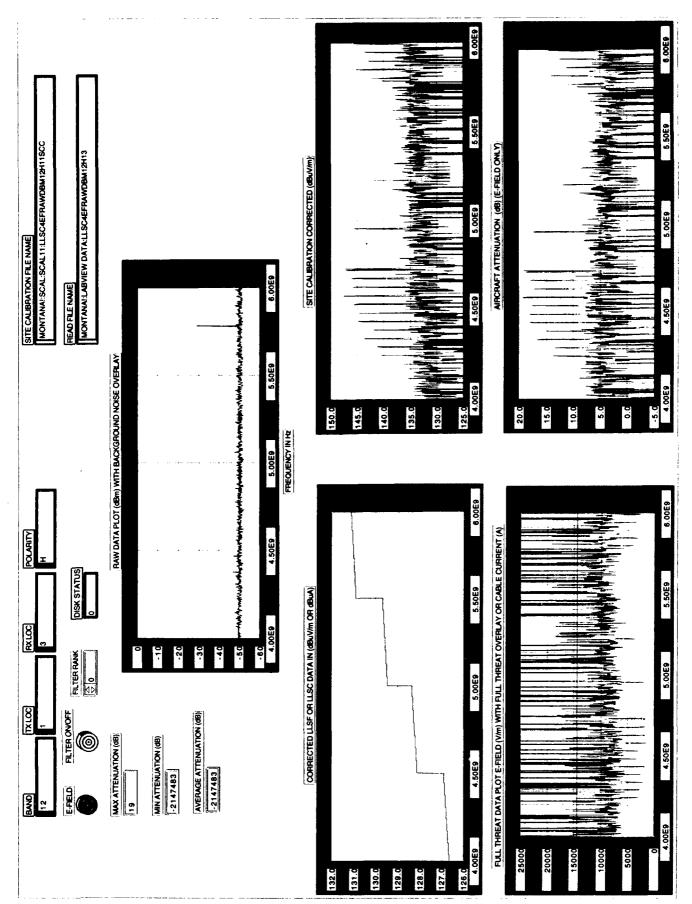


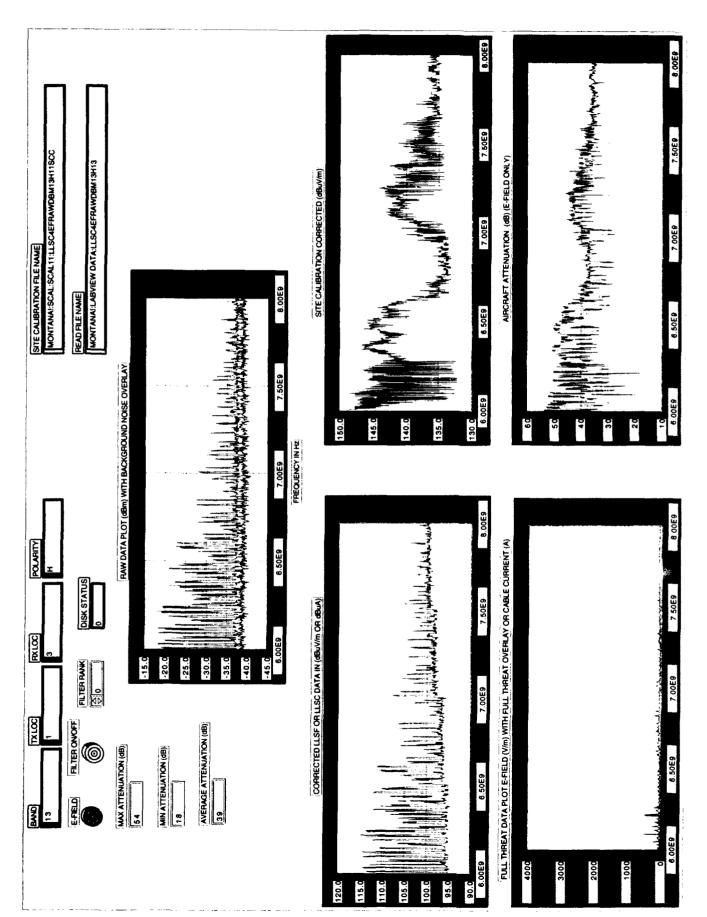


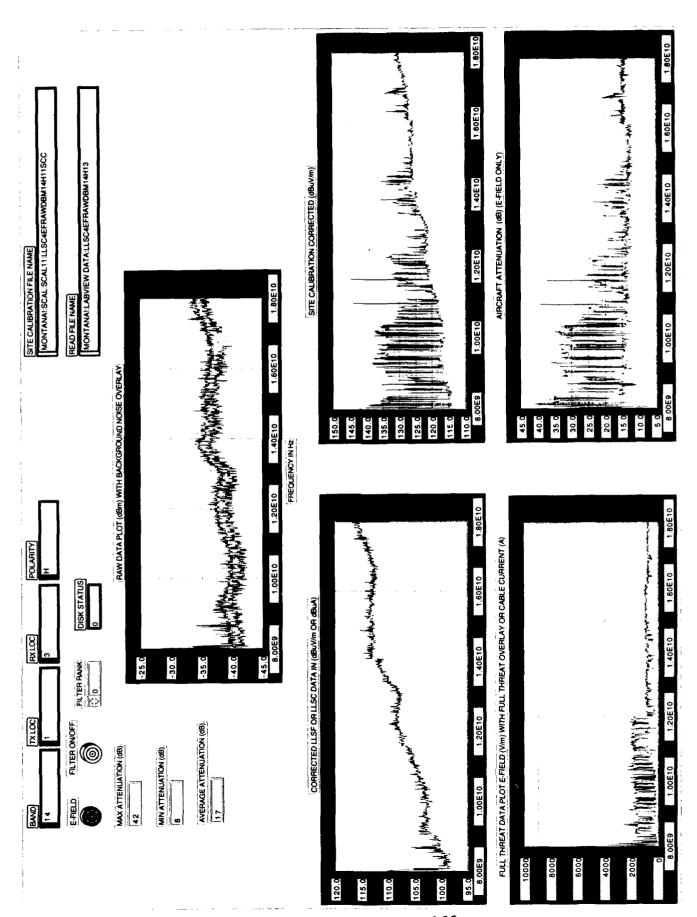


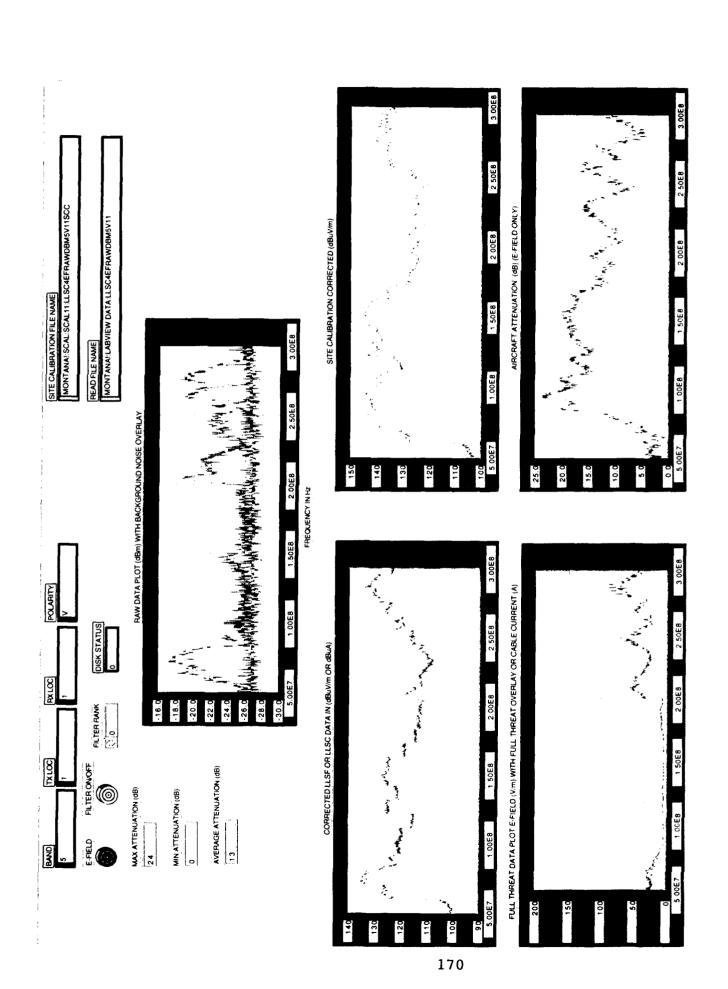


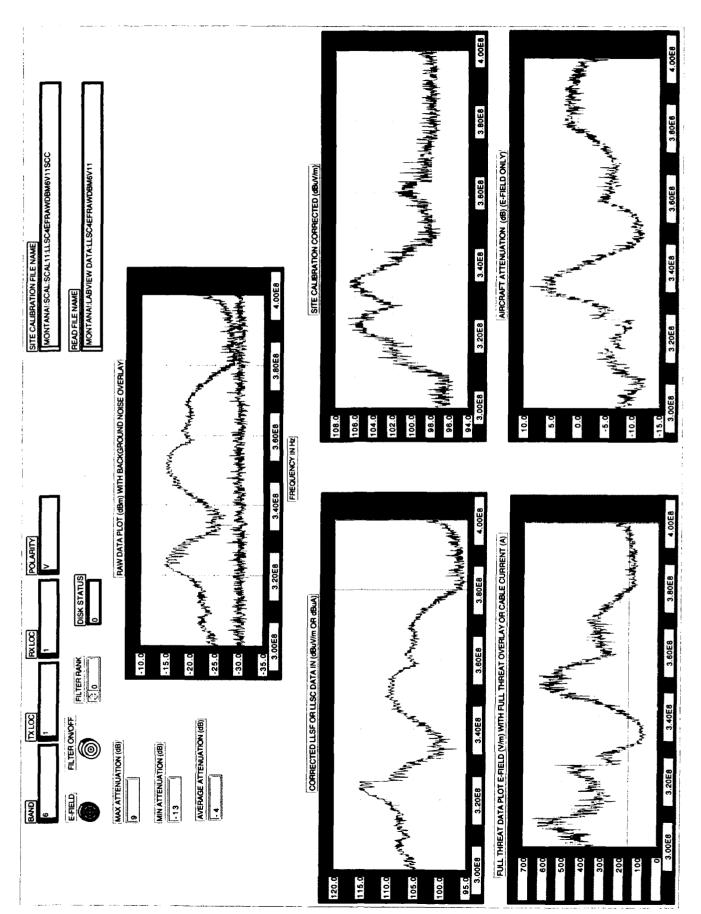


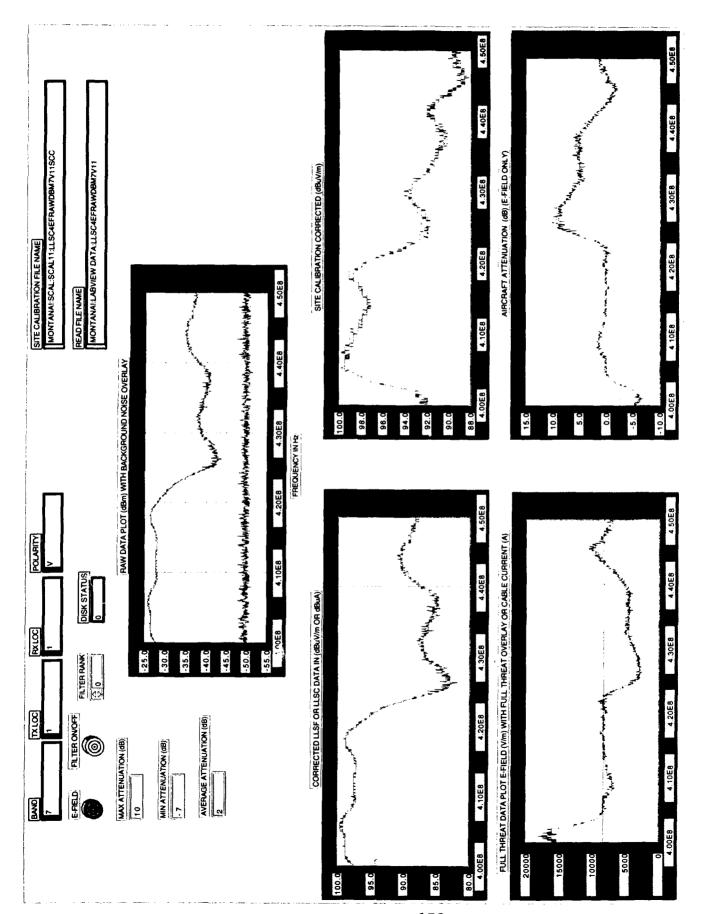


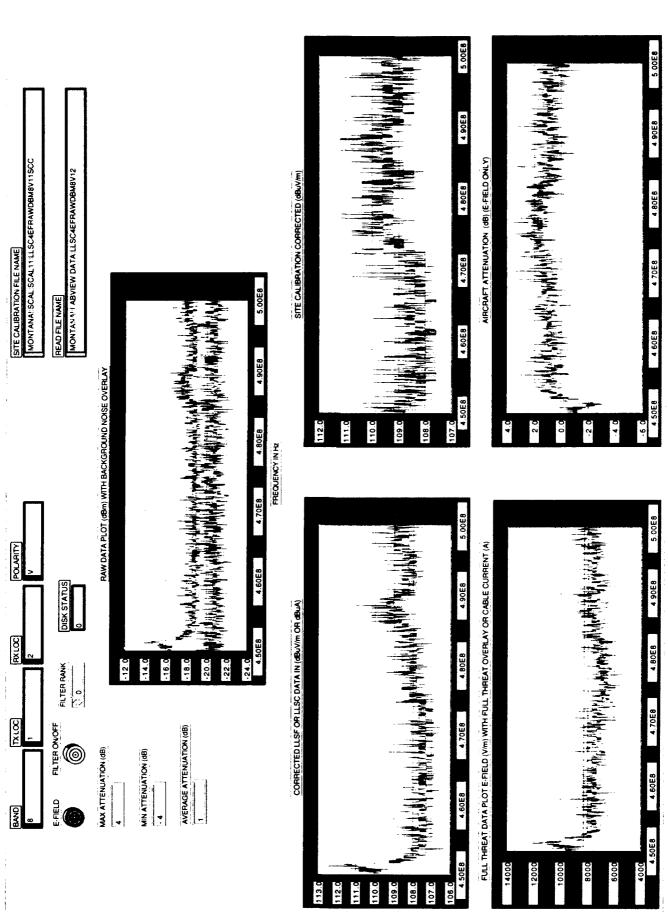


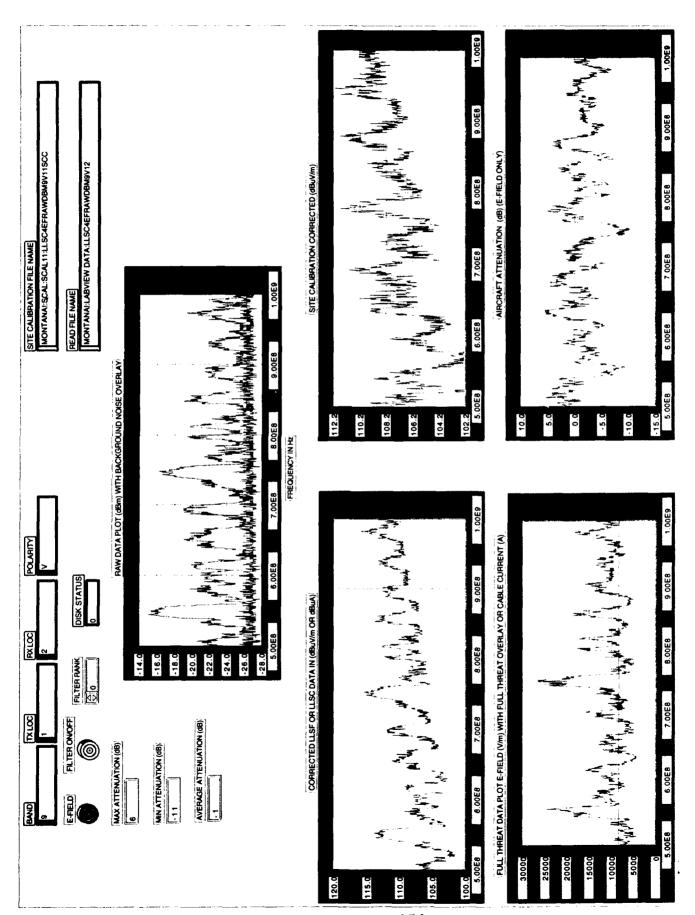


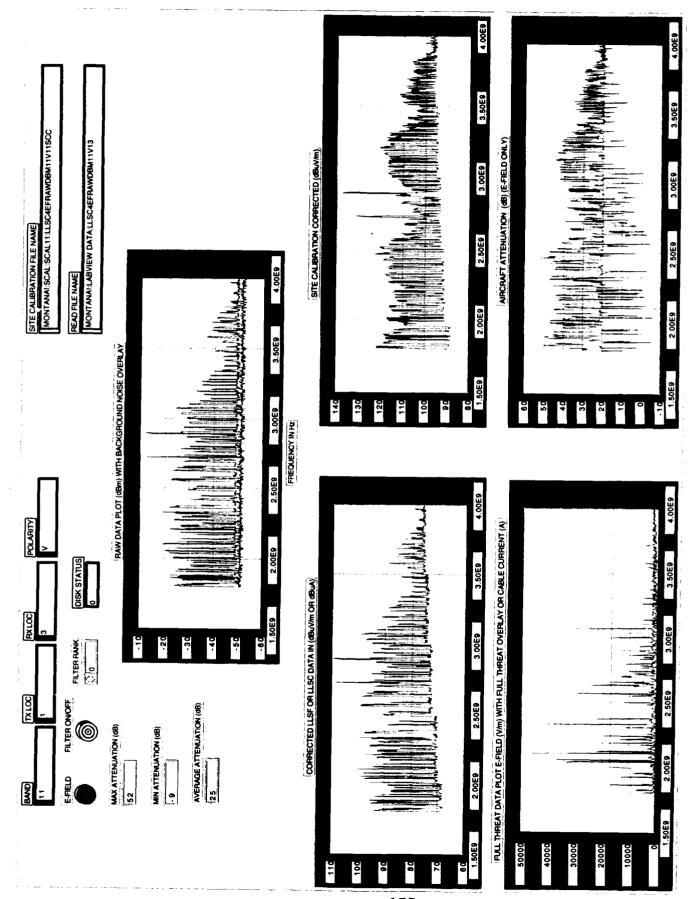


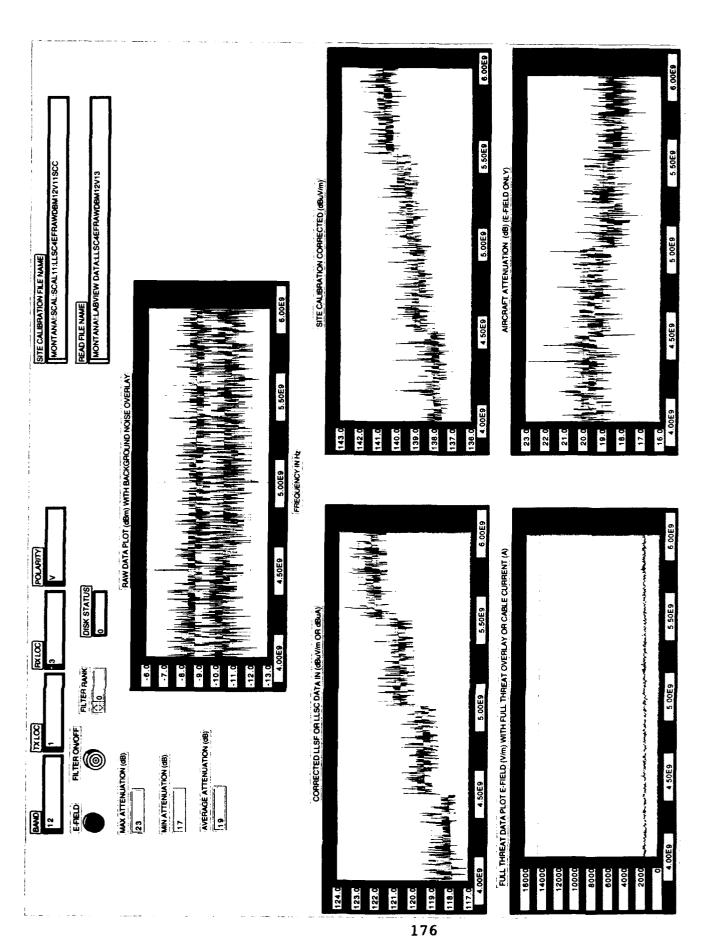


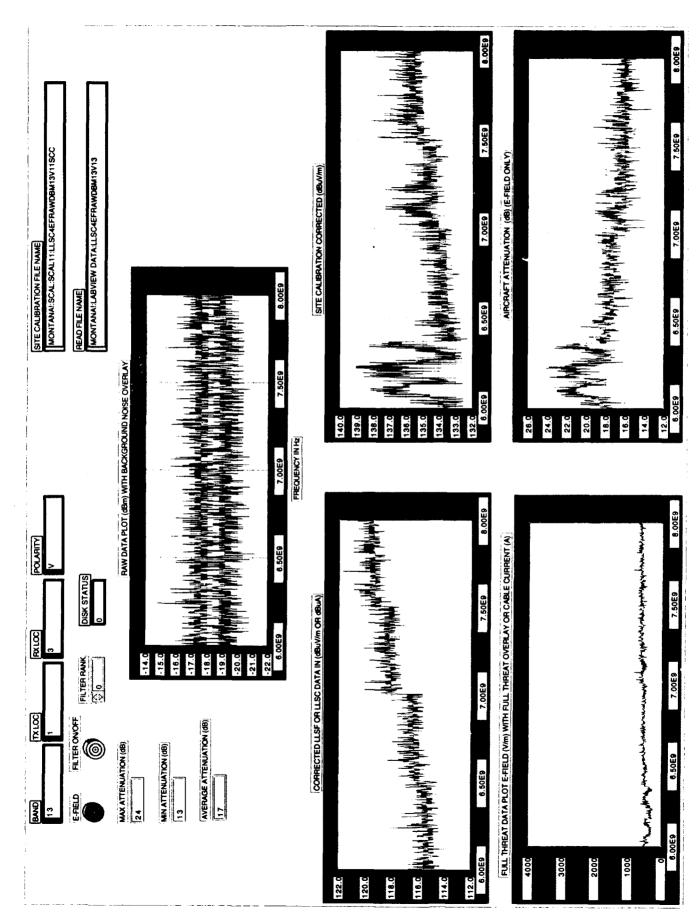


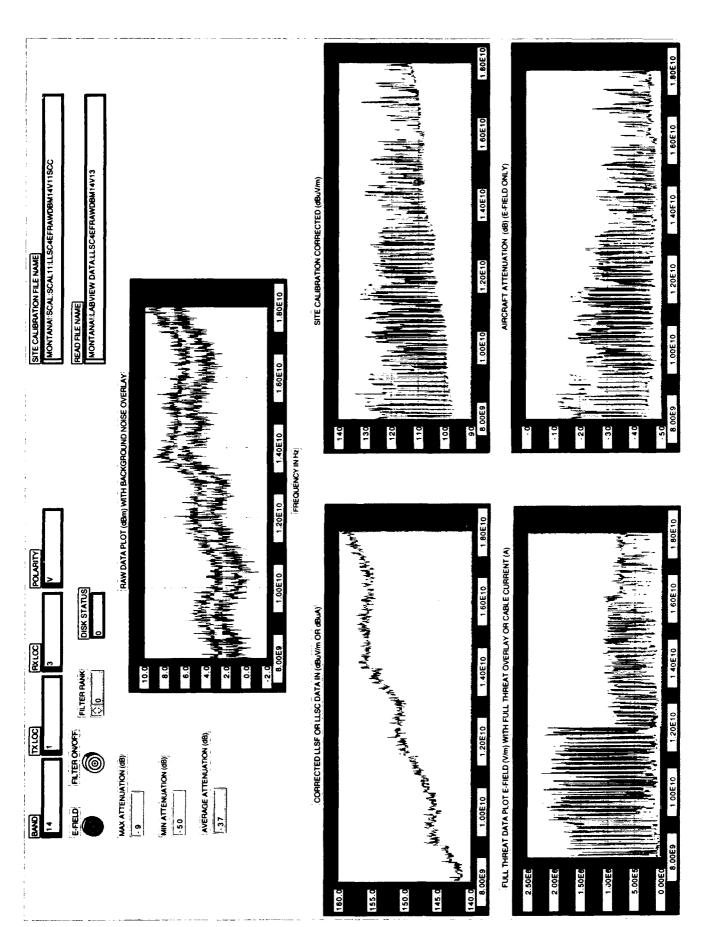


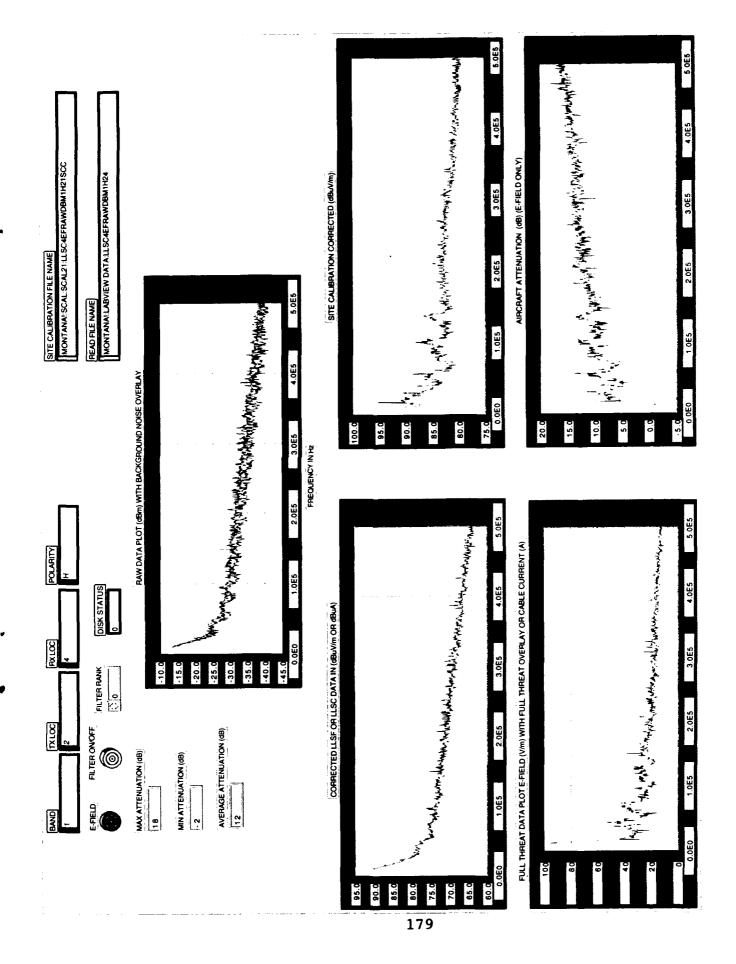


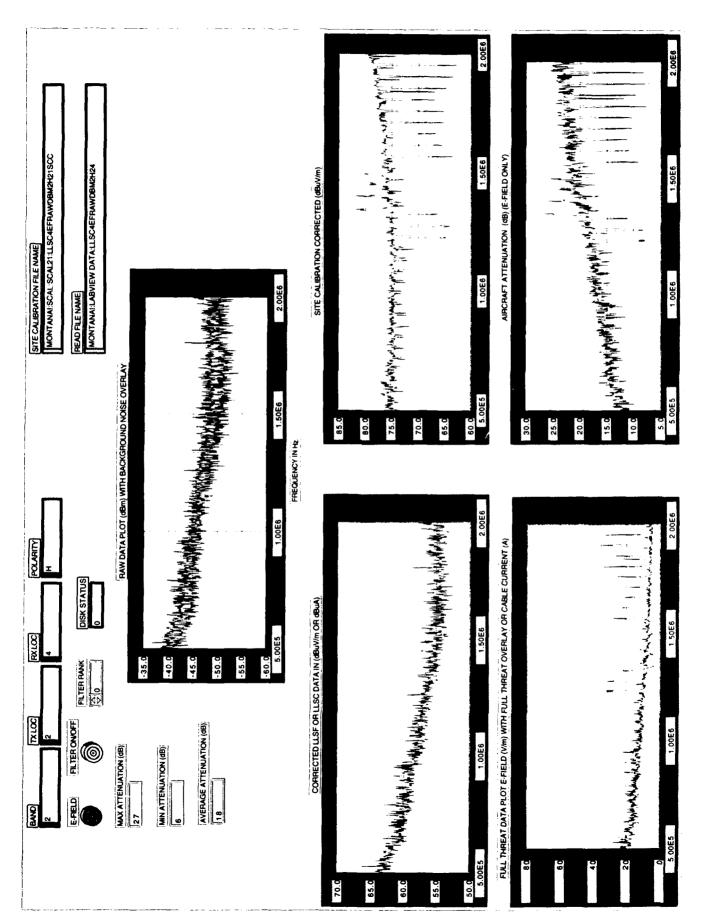


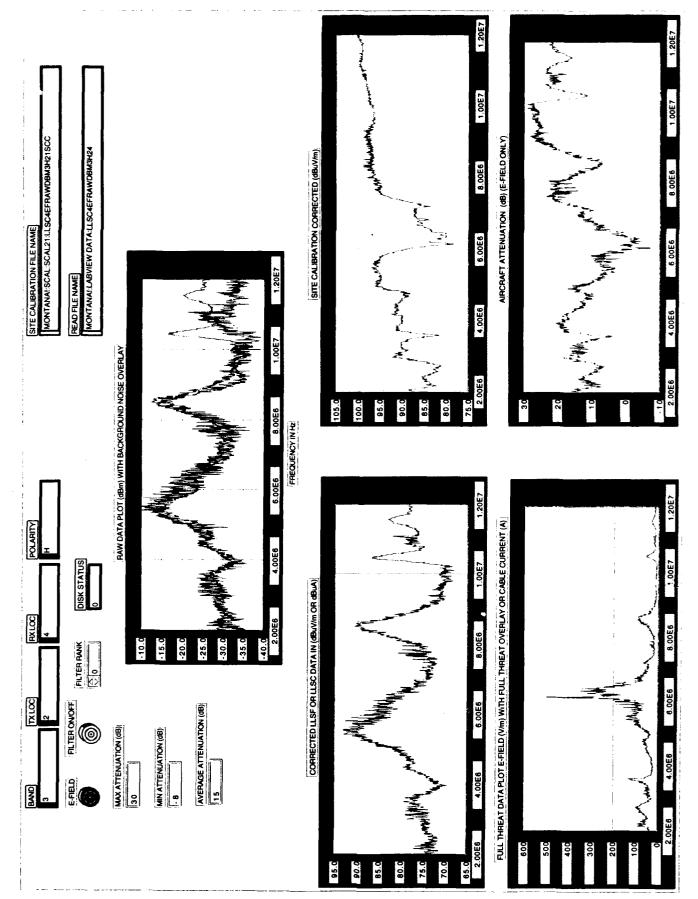


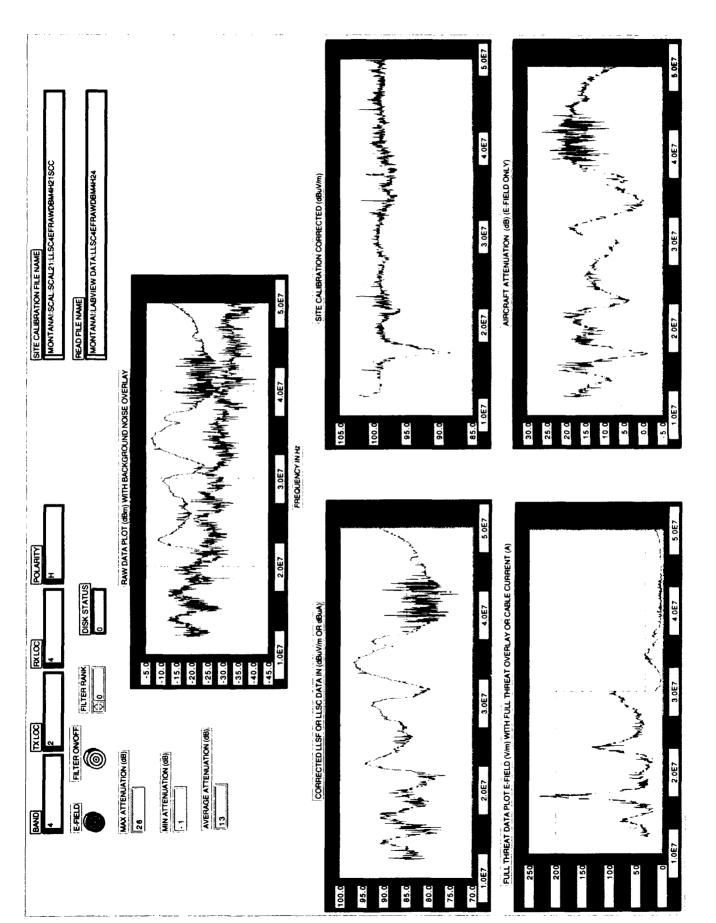


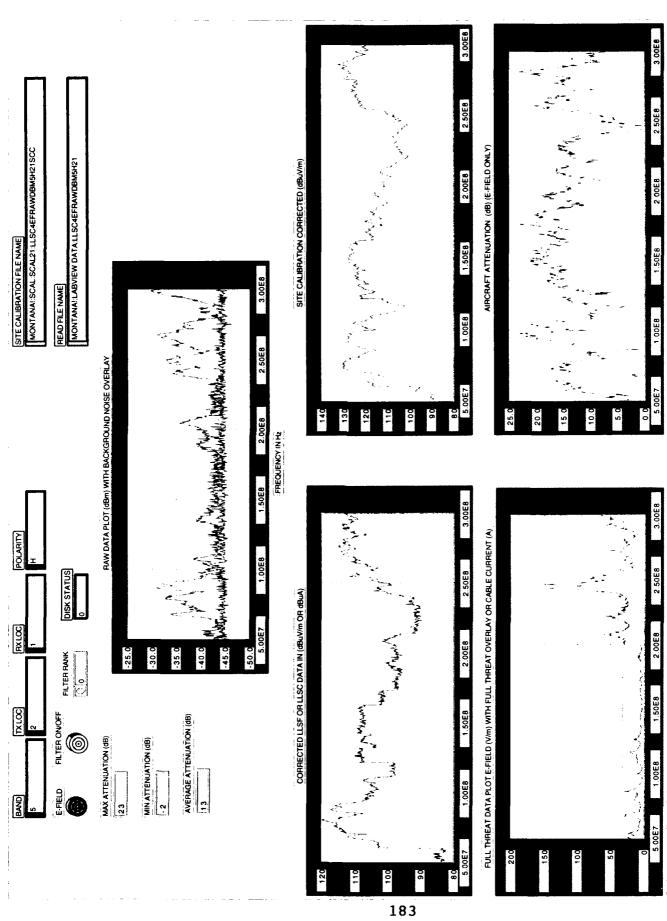


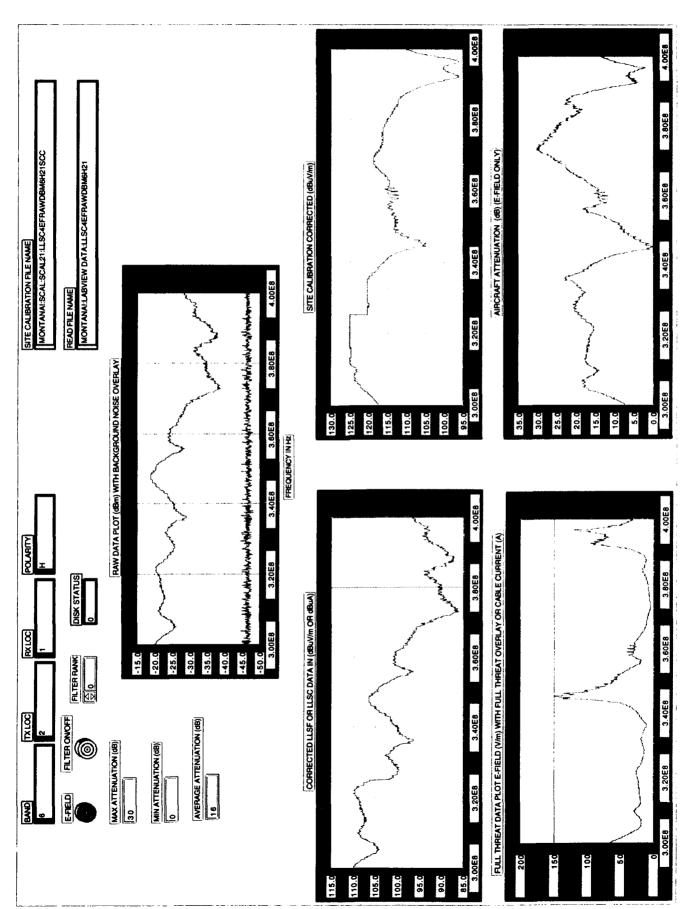


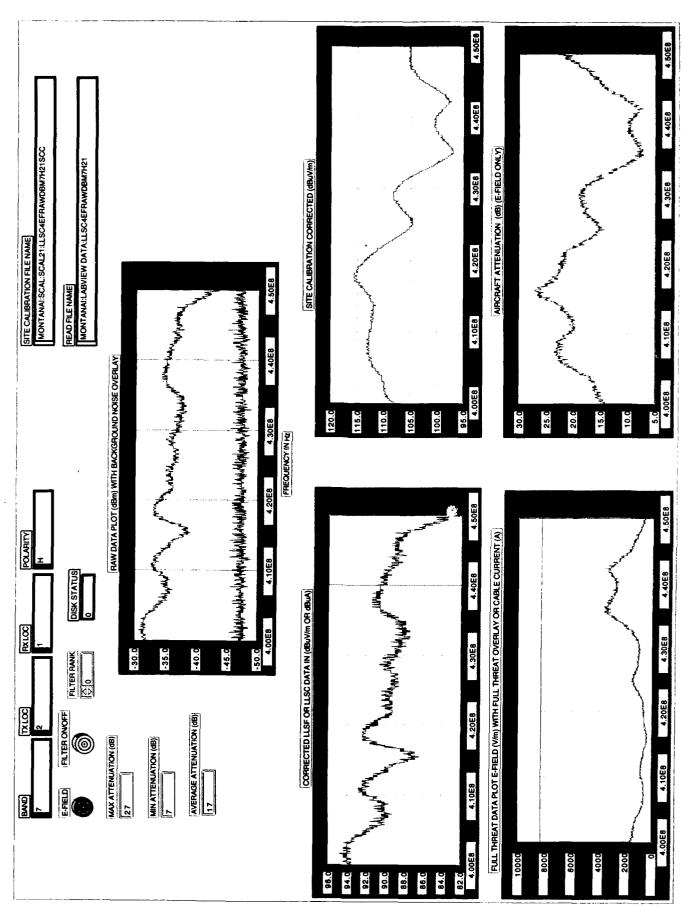


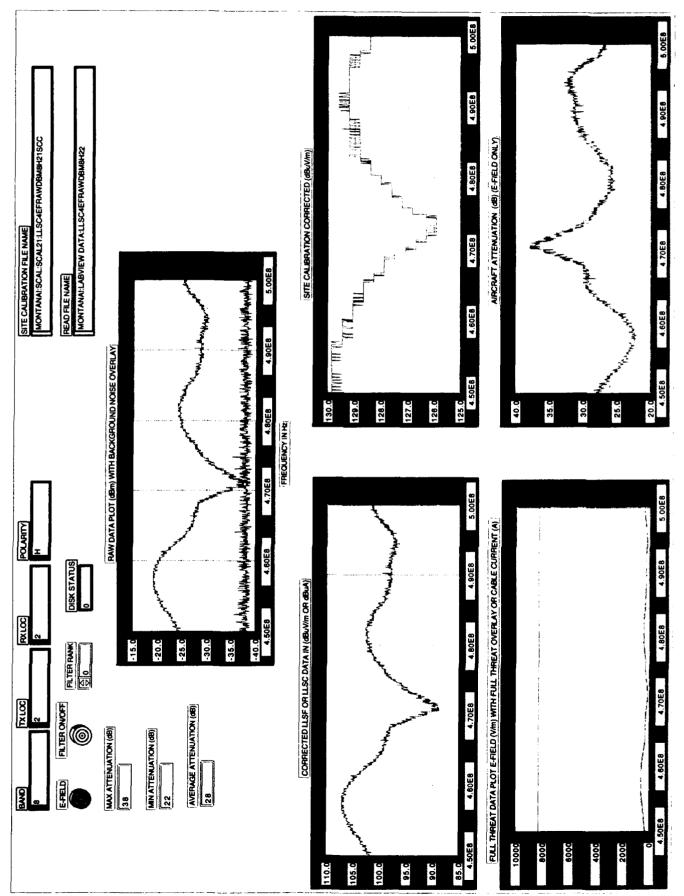




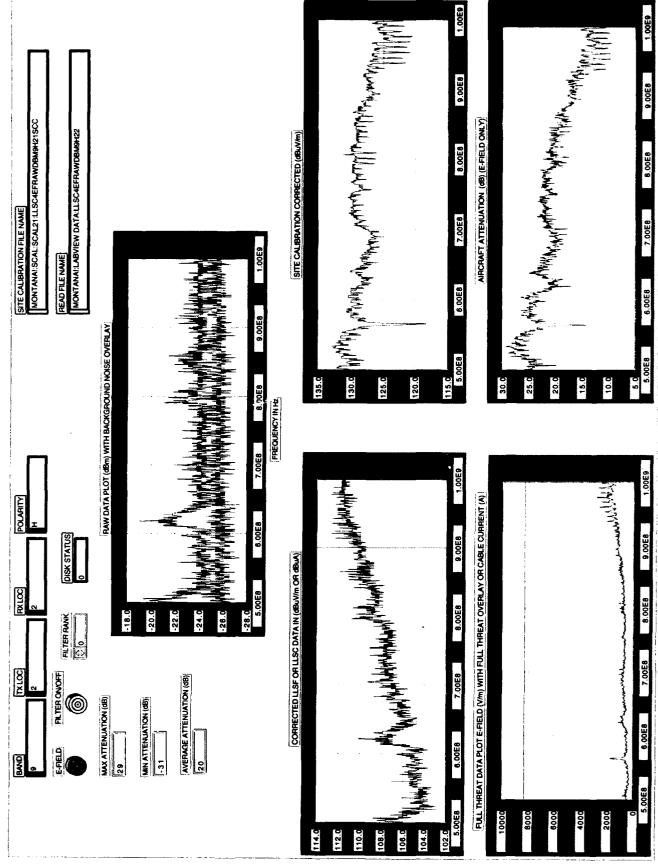


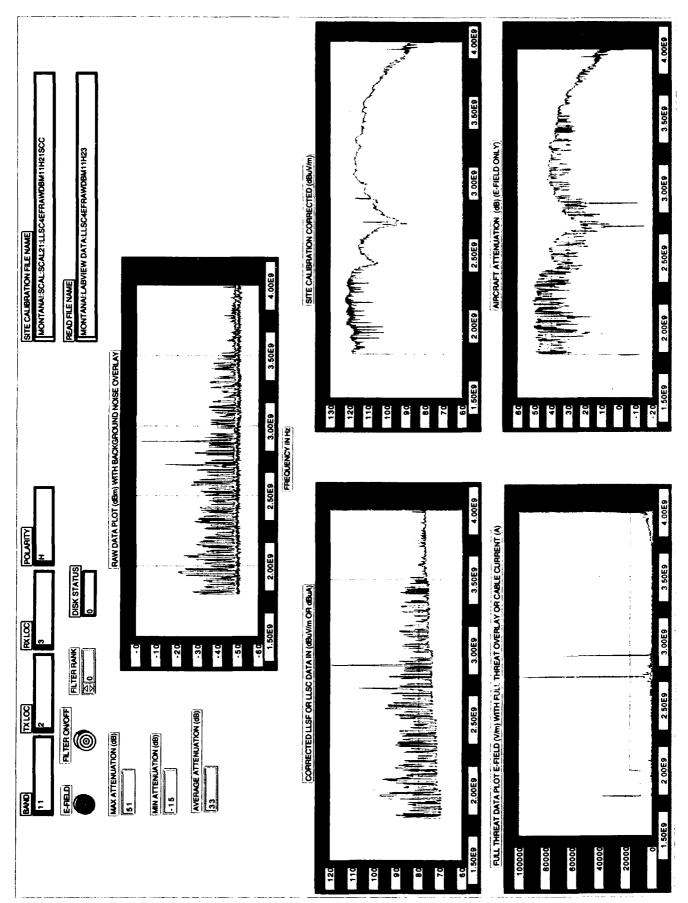




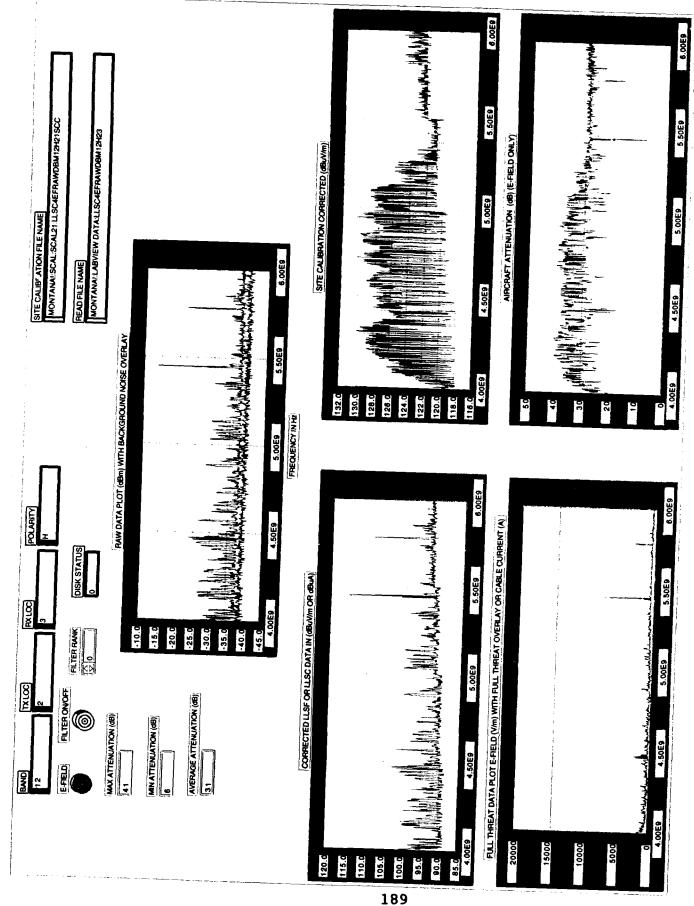


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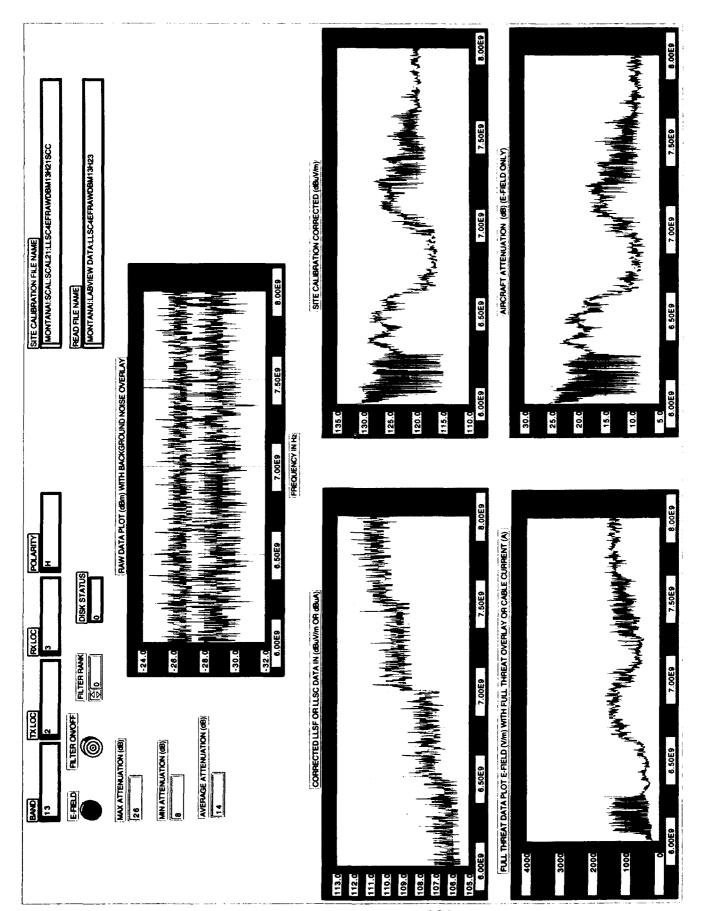




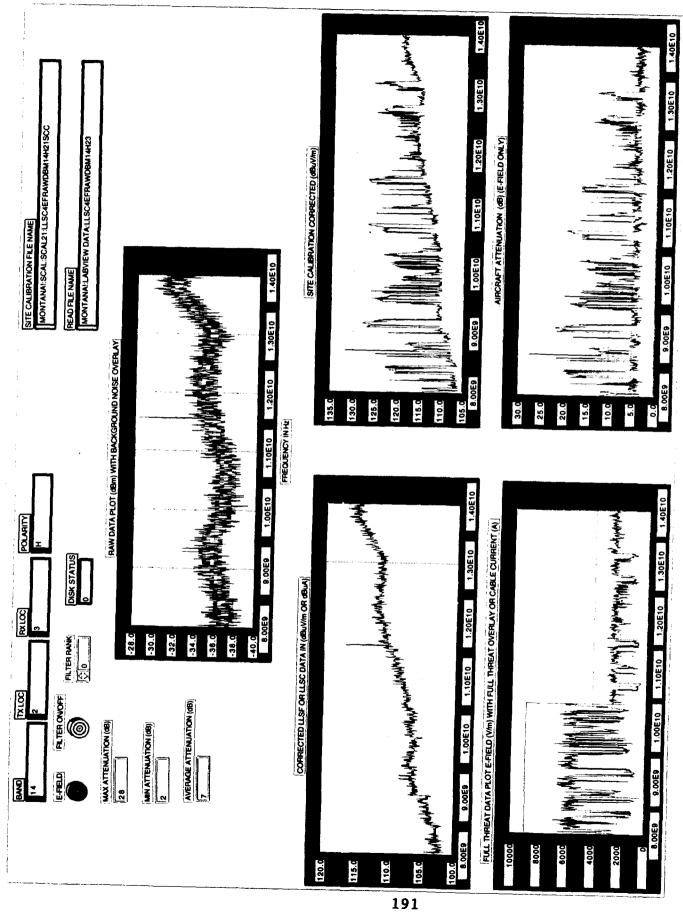
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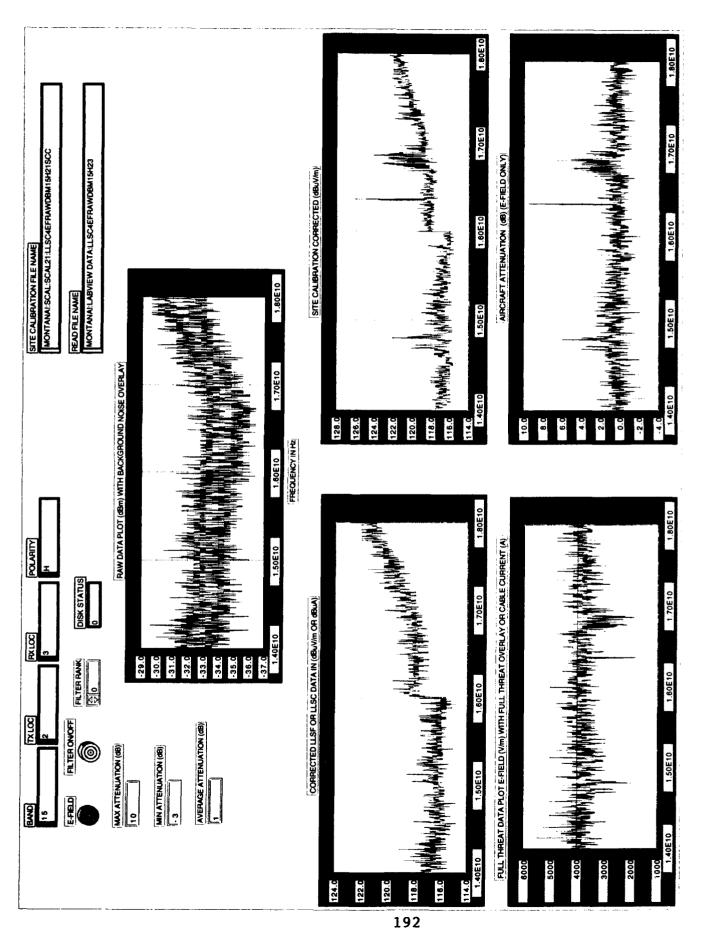
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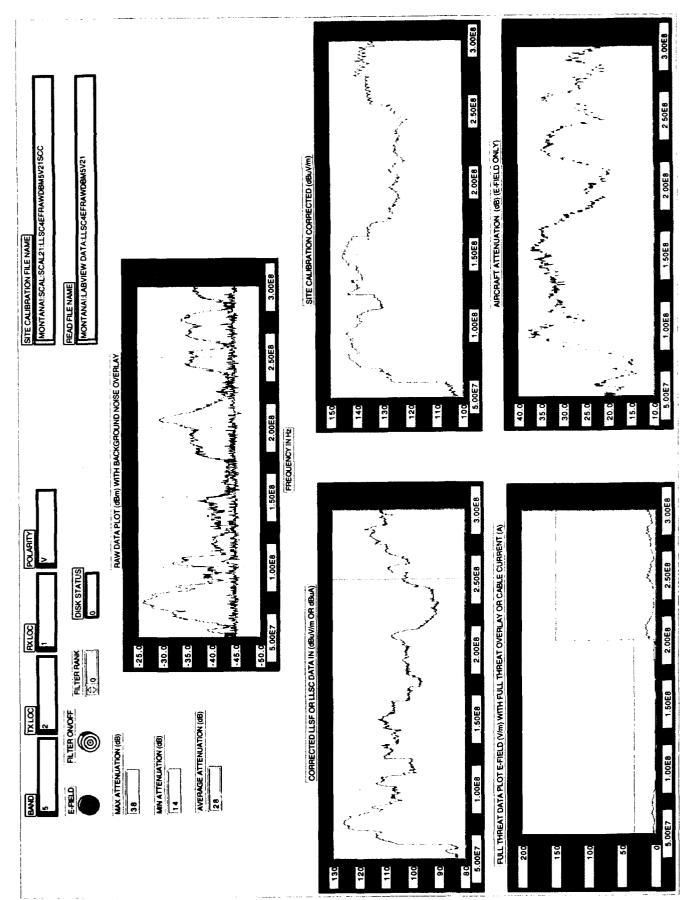


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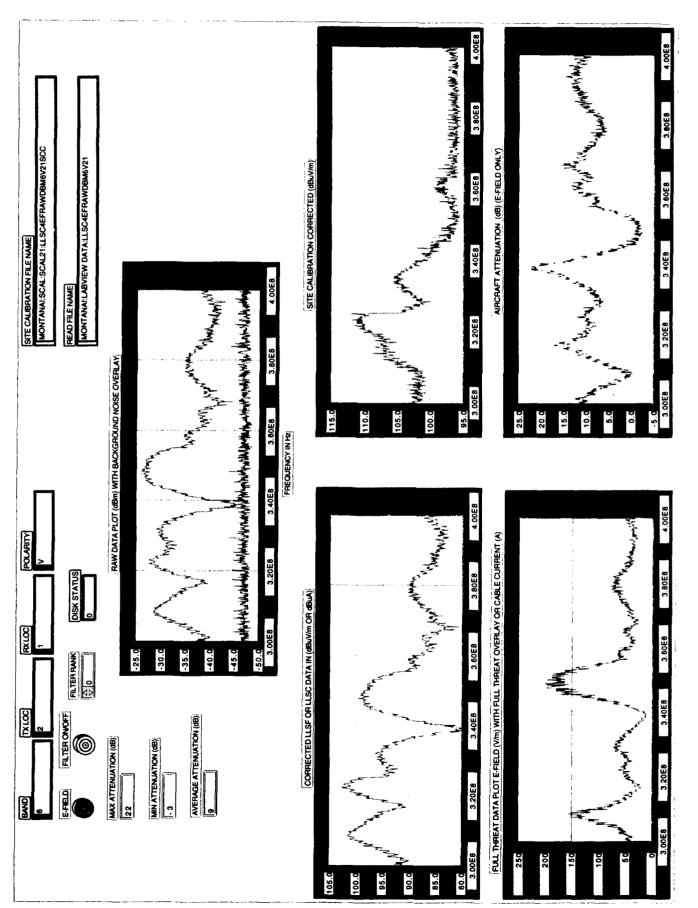


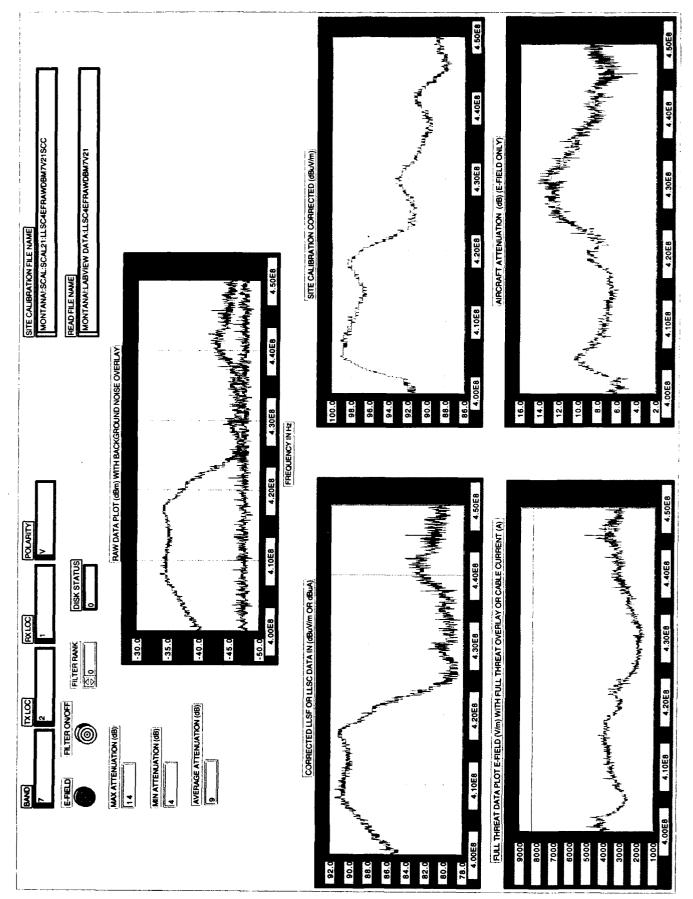
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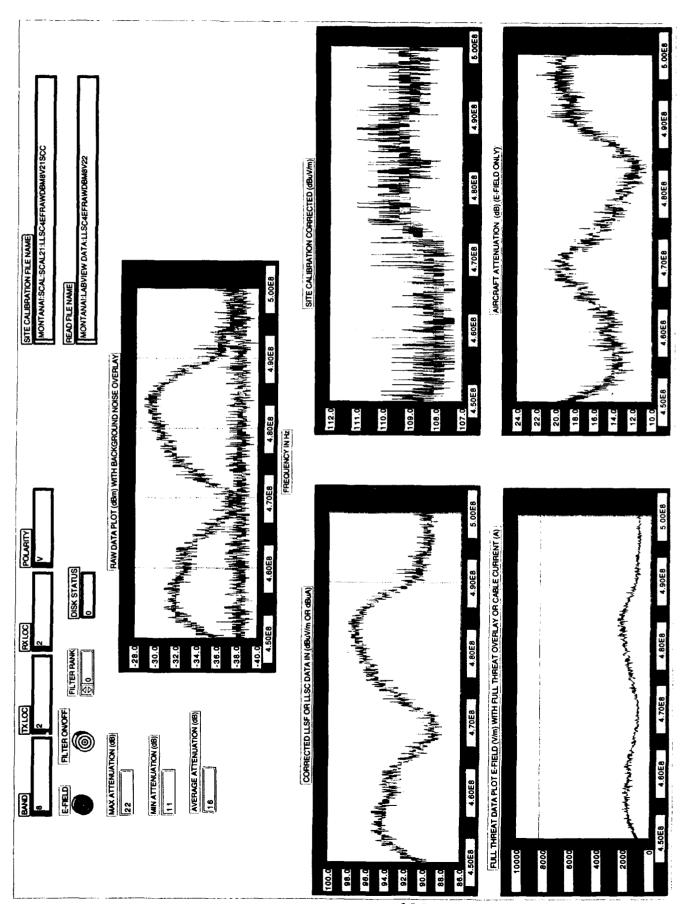


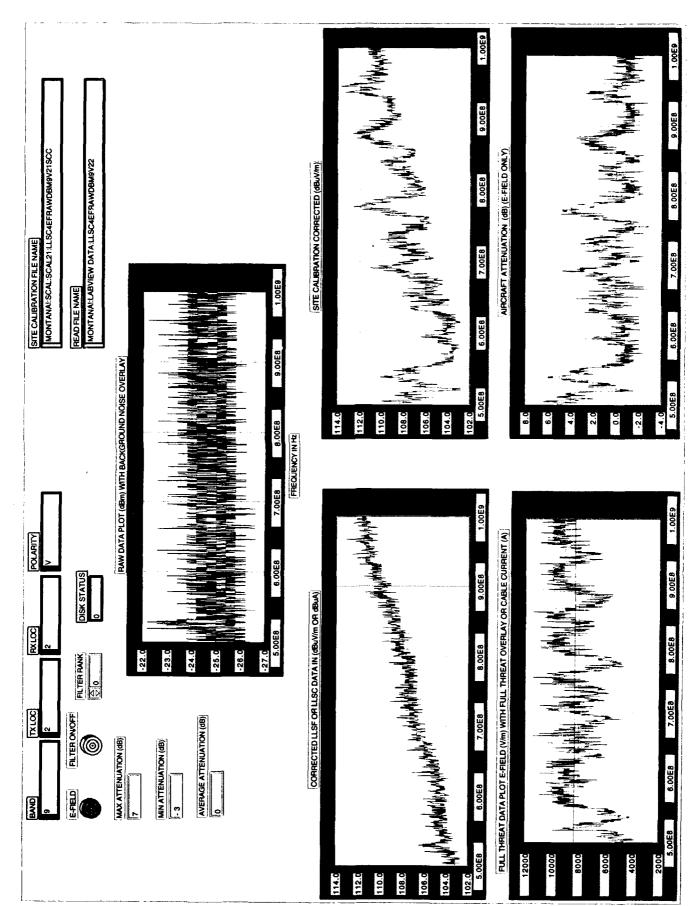


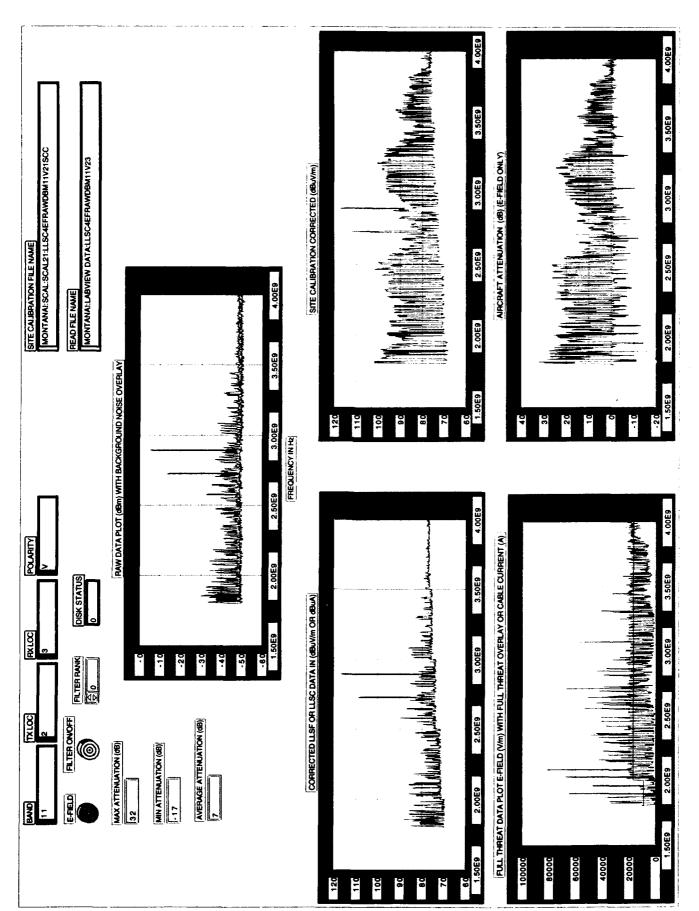
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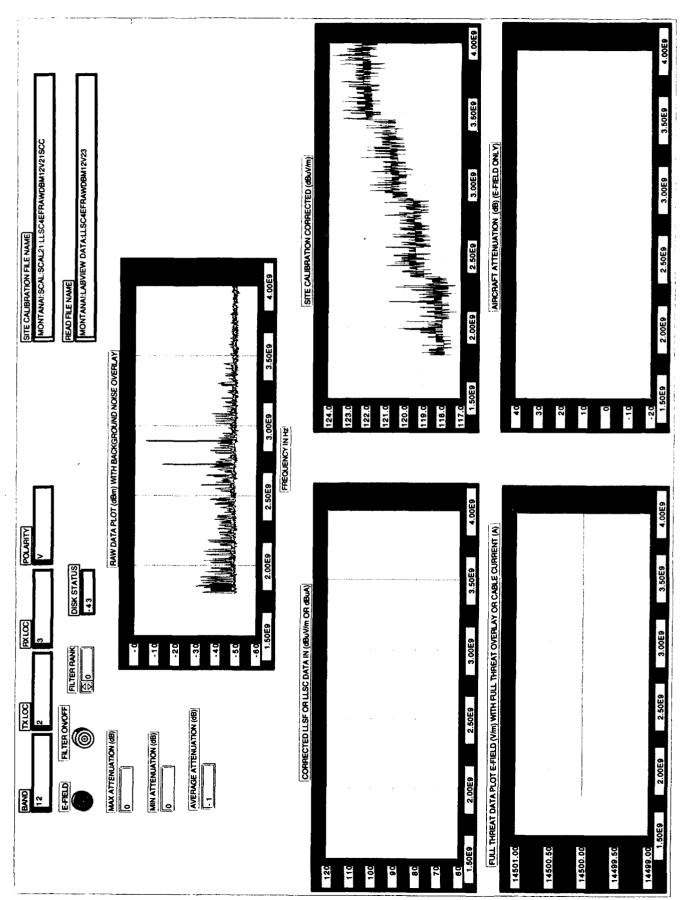


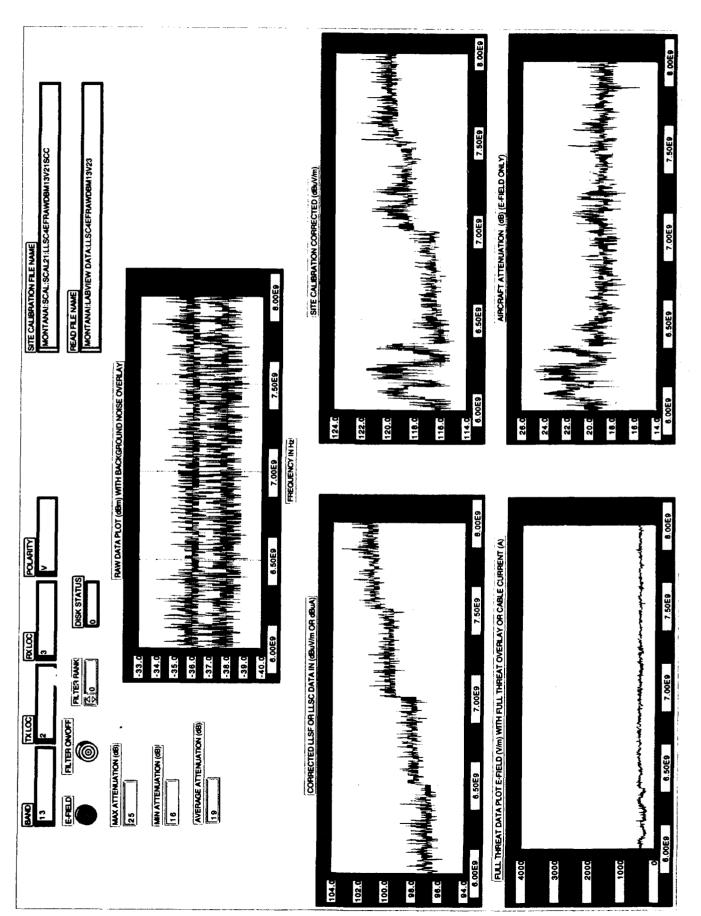


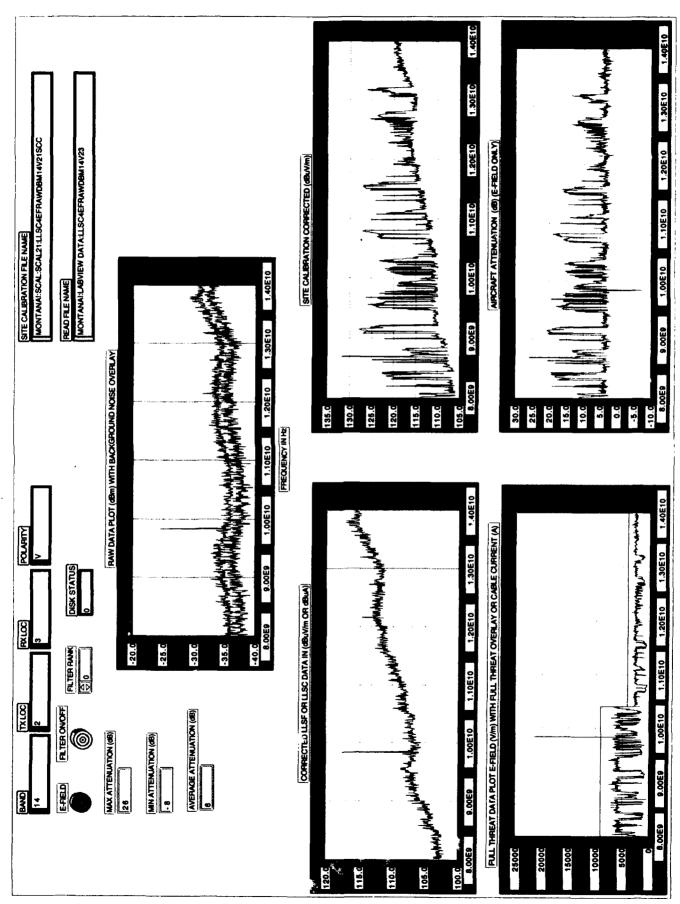




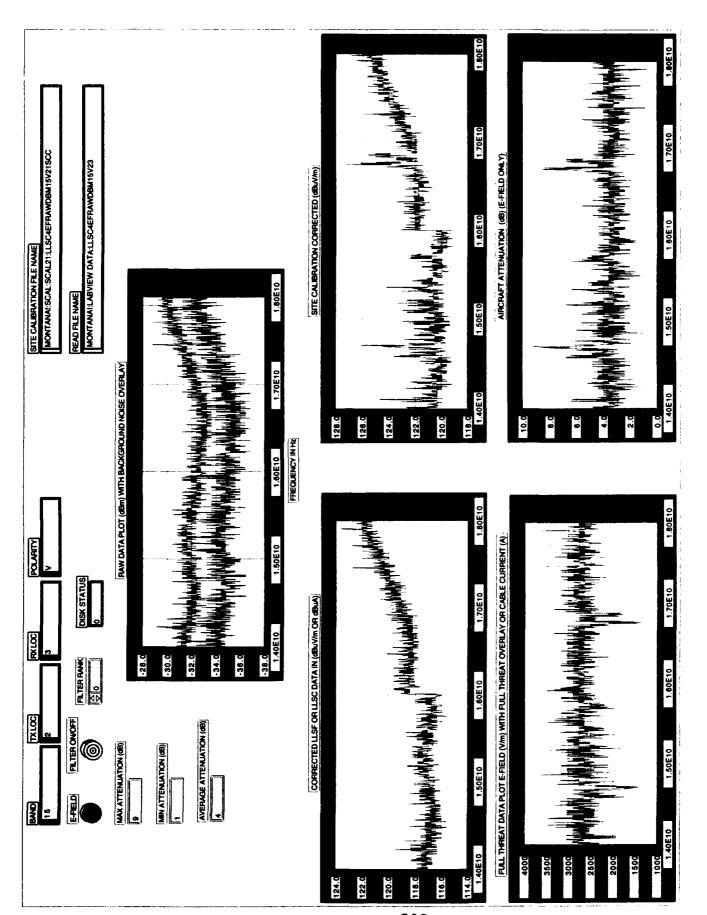








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